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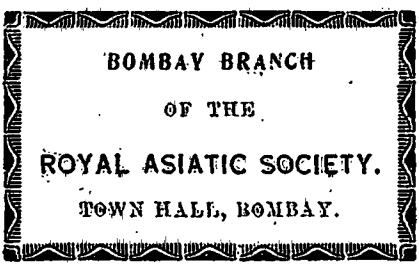

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THE GENERA

OF

RECENT MOLLUSCA;

ARRANGED

ACCORDING TO THEIR ORGANIZATION.

BY

HENRY ADAMS, F.L.S.

AND

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IN THREE VOLUMES.—VOL. I.

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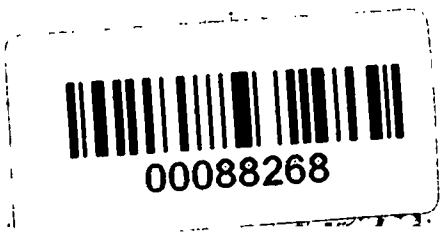

PREFACE.

In offering to the public their work on the "Genera of Recent Mollusca," the Authors believe they are supplying a want in this branch of Zoology, especially as active research is now being made into the structure and habits of the animals that produce the beautiful shells so much admired in the cabinets of Conchologists.

They have endeavoured, as far as the present state of knowledge on this subject would permit them, to group the Genera in accordance with their natural affinities, and they trust that, from the care with which they have consulted every original source of information, the work will prove a correct and useful guide to those who desire to become better acquainted with this interesting division of the animal kingdom.

The Authors desire to acknowledge their obligations to Dr. Gray, Mr. S. P. Woodward, and especially to Mr. Hugh Cuming, who, with his accustomed love of science, has afforded them liberal access to his unrivalled collection, and freely imparted to them much valuable information relative to the habits and localities of various genera.

With regard to the illustrations, the Authors may add, that many are derived from drawings of the living animals,

and where not original, have been faithfully copied or reduced from the various works quoted. For the figures of the shells, recourse has been had in almost every instance to the objects themselves.

October, 1858.

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MOLLUSCA.

ANIMAL soft, fleshy, furnished with a muscular coat termed a mantle; without any internal bony skeleton supporting jointed limbs, or external skeleton formed of a hard ringed skin; nervous system consisting of a number of medullary masses distributed in different parts of the body, one of the masses or ganglia placed over the gullet and enveloping it like a collar.

Molluscous animals, first separated as a Sub-kingdom by Cuvier, have no skeleton like the *Vertebrata*, and no jointed members like the *Articulata*; they are, moreover, known from the *Radiata* by their organs not radiating from a common centre. They have a heart and blood-vessels, a nervous system and breathing apparatus, and they are covered by a soft mucous membrane, which is named the mantle. The modifications exhibited in their organization constitute the basis of the arrangement followed in this work, which arrangement, although imperfect, may be termed the natural system.

When the locomotive organs of the *Mollusca* are placed in a circle round the head they form the Class *Cephalopoda*; when they swim by means of a pair of fins placed

at the sides of the neck they are called *Pteropoda*; when they crawl on the belly by means of a muscular foot they are termed *Gasteropoda*; those furnished with a pair of ciliated arms arising from the mouth constitute the *Brachiopoda*; those without a head and having the mantle protected by two shelly valves are named *Conchifera*, while those without any shell and covered merely with a fleshy mantle comprise the *Tunicata*.

The following is a Synopsis of the Classes:—

I. *Cephalopoda* or Cephalopods.

Animal with the foot wanting or rudimentary. Head large, distinct, furnished with eight, ten, or more arms, by means of which they crawl head downwards.

II. *Pteropoda* or Pteropods.

Animal with the foot wanting or rudimentary. Head prominent, with one or two pairs of fins on the side of the neck, by which they move about in the ocean. Body often covered with a thin glassy shell.

III. *Gasteropoda* or Gasteropods.

Animal crawling on a foot placed under the body. Head distinct, furnished with eyes and tentacles. Body usually protected by a conical or spiral shell.

IV. *Conchifera* or Bivalves.

Animal with a foot placed under the body. Head indistinct. Mouth placed between the gills. Body enclosed between two equal or subequal valves united along the back by a cartilage.

V. *Brachiopoda* or Brachiopods.

Animal destitute of a foot. Mouth placed at the base of two spirally-twisted ciliated arms

between the two leaves of the mantle, which are covered with two separate shelly valves. They live attached to other marine bodies.

VI. *Tunicata* or Tunicaries.

Animal destitute of shell, but protected by an elastic muscular mantle with two orifices. Gills in the form of a net-work or of a riband stretched across the internal cavity.

Molluscous animals have sufficient maternal instinct to select situations for *oviposition* most advantageous to the development of their eggs. The *Ampullariidæ* deposit their conglomerate egg-masses on stones and fragments of wood in the shallow parts of ponds, where the eggs are exposed to the full power of the sun. The *Doridida* and *Limnœidæ* glue their ova together and attach them in gelatinous bands to floating bodies, that they may neither sink beyond the influence of the solar heat, nor be dispersed by the action of the waves. The *Ianthina* and *Argonauta* bear theirs constantly about them, the first attached to a vesicular float, the second contained in a fragile shell. The *Carocolla* conceals hers under loose bark. The *Pythiæ* lay theirs under stones and in holes of rotten wood. The *Cyclostoma* buries hers in the yielding soil of decayed vegetable matter. The thick-shelled *Bulimi*, that live upon the ground, deposit large oval calcareous eggs among the leaves, while those lighter and more highly coloured species, that live upon the trees, glue their coriaceous ova to the under surface of the leaves, and some among them have sufficient ingenuity to roll up the edges of the leaves, cement them together, and form kinds of nests or cradles for their tender progeny.

The hard or soft albuminous capsules, or *oothecæ*, which defend and protect the ova of molluscous animals, offer a variety of forms. The eggs of the Cephalopods are either agglomerated into masses like bunches of grapes, as in the Cuttles, or into long garlands and strings, as in nearly all the Squids. The ova of marine Gasteropods are enveloped before exclusion in mucous capsules, in some cases soft, flexible, and transparent, which harden more or less by contact with the water, and assume forms peculiar to tribes and genera. This nidus or egg-nest is sometimes simple, but often compound, each compartment containing many ova. In *Mazza* the cells are of a flattened sub-pentagonal form, adhering together and piled one upon the other, each compartment containing from twenty to thirty embryos. The *oothecæ* of *Purpura hæmastoma* are yellow or rosy, elongated, quadrangular, and truncate at their ends, and are fixed in groups upon the rocks. The nidus of *P. lapillus*, which Ellis calls the sea-cup, is in the form of an elliptical vase supported on a short stem. The egg-capsule of *Neptunèa Norvegica* is attached, isolated, hemispherical, with a thin, coriaceous membranous coat. In *Buccinum undatum* the nidimental capsules are aggregated in large irregular masses, each case being oblong, one side convex, the other flat. The nidus of *Nassa reticulata* is in the form of a compressed pouch, with a short peduncle and an opening at the top. The small nidimental cells of the cowry are aggregated in a flattened group. In *Bursa* they are in numerous groups very close together, long, compressed, enlarged at the end, with one or two keels. In *Trophon* they are sub-cylindrical and truncate at the upper end, and deposited in groups on stones and fuci.

In *Rapa tenuis* the nidimental capsules are attached in regular linear series to portions of decayed wood; they are of a flattened subconical figure, adhere by the apex, and have the base emarginate. In *Murex endiva* the cases are tricarinated, one of the keels being bifid. In *Tritonium scaber* they are flattened and quadrangular, with four keels. In *Conus capitaneus* they are curved, with a dorsal keel, and with the free end falciform. In *Busycum affine* the capsules are arranged in a long string; they are oval, flattened, keeled, the edges angled, and attached by a short peduncle.

To enumerate a few more examples of the *oothecæ* of marine Gasteropods, — in *Acanthina unicornis* they are cylindrical, and adhere by slender peduncles in densely-packed masses. In *Chorus monoceros* the somewhat columnar egg-cases are united by slender peduncles in a large rounded mass, the capsules having lids which the young push off. In *Voluta* they are hard, vesicular, and fixed by broad bases, each containing but one embryo. In *Volutella* they are large and hemispherical.

The eggs of the *Naticidæ* are deposited in flat, spirally-rolled bands, which are partly buried in the sand; they have been mistaken for zoophytes, under the name of *Flustra arenosa*. The eggs of Nerites and Neritinas are ovate, covered with a horny shell, and affixed to the surface of stones or to other shells. The egg-mass of *Gibbula cineraria* is in the form of a white gelatinous ring, with a narrow break on one side.

In the Opisthobranchiate Mollusks the *oothecæ* are no less curious. In *Aplysia* they are excluded in a long string. In *Philine* the string is necklace-shaped, and coiled in a loose spiral. In the *Tritoniidæ*, or Sea-slugs, the ova are expelled together in the form of a long thread,

and arranged also in a spiral manner. In *Doris* they are in a spiral band. In *Tergipes* the egg-mass is saccate; in *Eolis*, funiculate.

In the air-breathing Gasteropods also the nidus varies. In the *Limnæidæ* it is transparent, gelatinous, and larviform, and the eggs are arranged in two layers, one above the other. In *Physa* it is oval and smooth. In *Coretus* it is shield-shaped, striated, and unattached. In *Ancylus* it is circular, flat beneath, and arched above, with the three-cornered eggs arranged in a circle in the middle. In *Bulinus* it is vermiform, free, and transparent.

In the terrestrial Gasteropods the eggs are usually spherical, opaque, and extruded separately. In *Onchidium occidentale* they are oblong, connected by a filament, rolled together in a ball, and deposited in shady places. In *Limax rufus* they are isolated, oblong, opaque, with white coriaceous shells, and heaped together under stones in moist places. In *Succinea amphibia* they are circular and transparent, without nidus, but united in a mass. In *Helix pomatia* they are opaque, white, and leathery, varying in number from thirty to thirty-six, and are deposited in holes in the ground; while in the tropical *Bulimi* they are often very large, oval, and calcareous, and sometimes protected by an artificial nest formed of leaves. The colour of the eggs of the air-breathing Gasteropods is usually bluish or milk-white; those, however, of *Achatina*, *Helix bicarinata*, and *H. purpurea* are of a beautiful yellow. They also vary greatly in size. In the common Snail they are no bigger than a mustard-seed, while in *Bulimus hæmastomus* they are almost as large as a pigeon's egg, with a hard calcareous shell.

The discovery of the *metamorphosis* of molluscous animals was first made by M. Sars in the Nudibranchs,

and afterwards confirmed by Van Beneden in the *Aplysiidæ*; since then it has been extended to the Prosobranchs by Lovén and Milne Edwards. The Bivalves also undergo a metamorphosis, but the Cephalopods do not appear liable to these changes.

The *larva* is always enclosed in a little, transparent, nautiloid, calcareous shell, provided with an operculum, and it swims freely through the water by means of two fin-like lobes fringed with long cilia. Instead of tentacles it has two veils shaped like ears, which disappear at a later period; the eyes, the ears, the liver, and the vent are as in the adult. This is the first stage. In the second stage it is still enclosed in a shell, but the mantle has become detached and covers the viscera, the foot is enlarged and projects beyond the operculum, and the head has two short conical ciliated tentacles. In the third stage the shell has fallen off, and the general shape is that of the parent, but the veils still remain. In the fourth stage the animal begins to crawl by means of its foot, the gills appear, and the mouth is armed with jaws and a spiny tongue. The last stage is marked by the fall of the frontal veils, and the completion of the tentacles and gills, thus concluding the metamorphosis.

The young bivalves are hatched in the gills of their parents, and have a swimming disc, fringed with long cilia, and furnished with a slender tentacular filament. The labial palps next become developed, and the disc gradually disappears. They then acquire a foot, and are provided with eyes near the labial tentacles, which, however, are afterwards lost. The young of the *Tunicata*, which are fixed in the adult state, swim freely about by means of a caudal filament or tail, until they have selected a proper spot to which they can attach themselves.

In a work like the present, which is intended to be entirely Zoological, the anatomical and physiological details are purposely omitted. The zoological peculiarities of the adult must now be briefly considered.

The *head* in some families is permanently extended and proboscidiform, as in *Littorinidæ* and *Melaniidæ*. In the predaceous Gasteropods it is furnished with a muscular trunk, which is often entirely retractile; but in the phytophagous tribes it is supplied with jaws for compressing the food. The head is often inconspicuous, as in many *Muricidæ;* in some it is long and flat, as in *Bursa* and *Sycotypus;* in some it is produced and cylindrical, as in *Cassidulus;* in some broad and flat, as in *Bulla* and *Luniceps.*

Some Mollusks are blind, as the *Eolis*, *Glaucus*, and *Doris*, and, in the adult state, the *Conchifera*. The *eyes* make their first appearance as coloured specks on the upper surface of the neck, as in *Aplysiidæ*, or on the head, as in *Bullidæ*. In their most perfect form they have iris, pupil, crystalline lens, choroid, vitreous and aqueous humours, and cornea, as in *Cymbium*, *Helix*, *Strombus*, and the Cephalopods. The eyes are two, symmetrical, usually at the sides of the head, sessile or pedunculated. In *Haliotis*, *Nerita*, *Turbo*, *Helix*, and *Onchidium*, they are at the end of long peduncles, or *ommatophora*. In *Muricidæ* and *Cypræidæ* they are extended on tubercles, connate with the tentacles; but in *Strombidæ* they are free. The *vision* of Mollusks varies with their habits. In the Bivalves and Tunicaries the eyes are readily dispensed with, the animals being either fixed or nearly motionless. In the Pectens, however, which swim rapidly by the flapping of their valves, the eyes are numerous and pedunculated, and situated at the bases of the pallial

tentacles. In the apathetic *Elysiidæ* and *Bullidæ* the eyes are sessile and rudimentary; but in the active and carnivorous *Strombidæ*, and in the air-breathing *Helicidæ*, they are elevated on peduncles, to allow a wider and freer range of vision.

Mollusca in general are *dumb;* the only instances to the contrary are the Cephalopods, which squeak and grunt when removed from the water, and the *Tritonia* and *Eolis punctata*, which produce a sound like the clink of a steel wire on the side of a jar. The noise produced by snails crawling on window-panes is merely mechanical. The *Tritonia arborescens* emits audible sounds under water, which, no doubt, are meant to be heard by other individuals, but the instrument adapted to receive sonorous undulations has not been detected; these lower forms may be said to hear with the whole surface of their body. Where it has been observed, the organ of *hearing* in Gasteropodous Mollusks is in the form of two round vesicles containing fluid and certain oval, calcareous, or crystalline oscillatory bodies situated on the head. In the bivalves there is only one otolith of large dimensions, which fills the cavity of the vesicles. The internal ear is most developed in the Cephalopods, some of which have even an indication of an external ear.

Smell exists in the Mollusca to a certain degree, but its organ has not yet been detected. Cuvier thought it resided in the soft mucous skin; the labial appendages, the respiratory apertures, and the surface of the tentacles may all receive impressions of odoriferous bodies. M. Valenciennes regards the hollow plicated process beneath the eye in the nautilus as an organ of smell. *Taste* may be exercised by the sensitive buccal appendages and soft membranes of the pharynx, but the tongue is a mere

mechanical organ for the attrition of food; gustatory *villi* have, however, been detected on the tongue of the Cephalopods. In the bivalves the mouth is supplied with two soft membranous palps, and in the Brachiopods with two ciliated arms. The mouth of the Cephalopods is armed with horny jaws, which act vertically like the mandibles of a bird. In the *Helicidæ* there is only an upper jaw, and in the *Limnæidæ* there are two accessory lateral jaws.

The *tongue* is a membrane covered with hooks or prickles, which are arranged differently in the different families. It usually forms a triple band, of which the central part is called the *rachis* and the lateral tracts *pleuræ*. The teeth on the middle part are termed *central*; those on the pleuræ are named *uncini* or *laterals*; it is sometimes broader than long, as in *Tritonia* and *Doris*, or it is elliptical and spoon-shaped, as in the *Helicidæ*. In others it is riband-shaped and much longer than the body, in which case it is reversed along the gullet and coiled spirally in the stomach. In the carnivorous families the tongue is forked and fleshy, armed with sharp curved teeth and placed at the end of the muscular proboscis, while in the phytophagous tribes it is very long and spiny, for filing their food to pieces. There is no tongue in the *Tunicata*, while in the bivalves it appears in the form of a gastric dart, a cartilaginous stiliform body enclosed in a sheath with a tricuspid free extremity and attached to the sides of the stomach.

In the *Doris* and *Aplysia* there are no jaws, and the cartilaginous surface of the tongue is covered with curved spines. In the *Patella* the tongue is of great length, and is covered with transverse rows of spiny teeth. In the Cephalopods it is short and muscular, and covered with rows of spines. M. Lovén has demonstrated that im-

portant generic and specific characters may be derived from a careful examination of this organ. In the *Bullidæ* the rachis of the tongue is unarmed, and the trituration of the food is effected by means of calcareous plates in a muscular gizzard.

The organs of *touch* in the Mollusca are in the form of soft fleshy tentacles without joints. Usually in the Gasteropods there are two arising from the sides of the head, sometimes free, as in the snails, sometimes united with the eye-pedicles, as in the Murices, and sometimes partially free, as in the Strombs. In the Tunicaries and Bivalves there are numerous tentacles placed around the breathing apertures and margins of the mantle. Additional pairs of tentacles at the sides of the mouth, called buccal appendages, and also prolongations of the lips, termed labial appendages, are often supplied, as in the *Aplysiidæ* and *Onchidiidæ*, and occasionally the exposed surface of the mantle exhibits fleshy tentacular extensions, which serve to apprize the owners of danger. In the Pteropods and Cephalopods long tentacular arms are extended round the head for the more accurate perception of touch, and in the *Trochidæ* and *Turbinidæ* the sides of the foot are furnished with tentacular filaments for the same purpose.

The *foot* is a muscular organ usually developed in proportion to the locomotive powers enjoyed by the animals; it is wanting in the oyster, which is fixed, but in the snail it is long and broad. By means of a muscular foot the *Pholadidæ* and *Solenidæ* burrow in the mud, the *Limnæus* swims at the surface of the water, and with their grooved and linear foot the Nudibranchs clasp the stems of floating fuci. In the Atalants it is compressed laterally into a swimming fin-like organ; and in the *Dolium* it is sometimes greatly expanded by the introduction of water.

Many Mollusca are furnished with numerous complicated canals which communicate with the surrounding fluid and serve (as in *Dolium*) to distend the foot by the admission of water. In *Cypræa* there is a long slit in the sole of the foot near its middle. In *Haliotis* there are two or three pores at each extremity, and in *Doris*, *Aplysia*, and *Bulla* there is a series of orifices placed round its edges. In many families the sole of the foot is imperforate, as in *Turbo*, *Trochus*, *Murex*, and *Purpura*, when the water enters by a peculiar orifice near the vent, from whence it finds its way into the canals that ramify through the foot. The use of this system of aqueducts, as Dr. Johnston has termed it, is to distend the various organs and render them more firm and capable of muscular exertions.

The dorsal surface of the foot secretes certain horny or calcareous layers, which constitute the *operculum*, a flat body, which closes the mouth of the shell when the animal is retracted. When the animal is too large to enter the shell, the operculum is absent, as in *Haliotis*, *Gena*, and *Stomatia*, or is rudimentary, as in *Sigaretus*. When the animal is entirely retractile within the shell, the operculum is larger. It is round in the vegetable-eating tribes, as in *Turbinidæ*, and unguiform in the flesh-eating tribes, as in *Muricidæ*. When the animal envelopes the shell in lobes of the mantle, there is no operculum, as in *Cypræa*, *Marginella*, *Cypræcassis*, and *Sycotypus*. When the foot is large the operculum is small, and *vice versâ*. In some tribes the operculum is stony, as in *Turbinidæ*, while in others it is horny, as in *Trochidæ*. In other cases it is stony, in one genus of the same family, as in *Natica*, and horny in another, as in *Lunatia*, or rudimentary, as in *Sigaretus*. The operculum consists of a hardened portion of the skin, the cells of which are filled

either with horny or calcareous matter. Sometimes an operculigerous lobe is developed around the operculum, and secretes a coating of enamel on the upper surface, as in *Imperator*, *Turbo*, and *Phasianella*.

The operculum may be annular and multispiral, as in the *Trochidæ*; annular and paucispiral, as in *Modulus*, *Echinella*, *Stomatella*, and *Euchele*; or subannular and ovate, as in *Distortio*, *Bursa*, and *Murex*; or subannular and unguiculate, as in *Strombus* and *Harpago*. It may be also spiral and ovate, as in *Littorina* and the *Naticidæ*; or spiral and orbicular, as in *Tympanotomus* and *Cerithidea*. The most singular variations of this organ are in *Hipponyx*, *Calyptræa*, and *Ianthina*. In the two former genera it is a calcareous plate, and fixed to foreign bodies, while in the latter it is vesicular, and serves as a float.

The *mantle* is a muscular sac, which envelopes the body. It is usually open in front, and secretes a shell, which serves to protect it. Sometimes the shell is contained in the substance of the mantle, as in the Cephalopods and *Aplysiidæ*; and sometimes the edge of the mantle is extended and covers the shell, as in *Cypræidæ*. The front edge is often simple and thickened, as in *Trochidæ*; furnished with filaments, as in *Strombidæ*; or with complicated fringes, as in *Muricidæ*. In some tribes, as in the phytophagous Gasteropods, the margin is entire; but in the zoophagous tribes, it is prolonged into a tube or *siphon*.

The shells of Mollusca have been compared to the skeletons of Vertebrate animals; but they are obviously, as shown by Dr. Carpenter, nothing but portions of calcified skin. The mantle, which is a mucous membrane, throws off an epithelium, which secretes a calcareous

matter in its cells, and becomes hardened into a layer of shell. The *epidermis*, like that of other animals, is inorganic, and cast off occasionally by the animal. This calcified epithelium or shell-structure is formed either of *prismatic cells*, filled with calcareous matter, and arranged perpendicularly in layers, or it is composed of thin *membranes*, which deposit the shelly matter on their surface. When the membranes are finely plaited, and the folds lie one over another, the nacreous or pearly appearance is produced. Sometimes the membranous shell-structure is traversed by *tubes*, the direction and distribution of which vary in different genera, but usually they form a network. Occasionally the prismatic shell-structure is very large, and the cells are hollow, as in the *Rudistes* among Bivalves; this constitutes the *cancellated* shell-structure.

The margin only of the mantle has the power of giving origin to the *outer* layer of the shell, while its whole surface may generate the *inner*. As the animal increases in dimensions, each new interior layer of shell projects so far beyond the preceding, that the new border composed of the outer layer is simply joined on to the margin of the former one. The colour is situated always in the outer layers, and is furnished by glands in the edges of the mantle; and the secretion of the colouring-matter, being uninterrupted, or interrupted at regular intervals, produces all the stripes and spots which serve to ornament shells.

The shell is moulded on the mantle of the animal, so that some of the most distinguishing generic characters may be detected from its examination. The edges of the mantle are often developed into fringes at certain periods, and form the spines and ribs, and all the irregularities seen on the surfaces of shells.

In the Gasteropods the shell is sometimes wanting, as in the Nudibranchs; in others it is very small and rudimentary in the skin of the back, as in the *Aplysiidæ*; and in some it only covers important organs, as in *Carinaria* and *Testacellus*. In the *Chitonidæ* it is composed of several pieces, but in the generality of cases it consists of a hollow cone closed at the apex, and more or less spirally rolled. In *Patella* and *Dentalium* the cone is nearly straight. In *Vermetus* and *Scalaria* it is spiral. In *Helix* and *Coretus* the spiral whorls touch. In some the spiral is elevated, in others depressed; in some smooth on the outside, in others spiny or tubercular. In the carnivorous tribes the aperture of the cone is emarginate and produced into a calcareous tube, which lodges the siphon or muscular prolongation of the mantle that conveys the water to the gills; but in the herbivorous orders it is usually round and continuous.

The Mollusca, like all other animals, are liable to attacks of parasitic epizoa and entozoa. The *Thetis fimbria* is infested with the *Vertumnus thecidicola* of Otto. Certain mussels have as a parasite *Aspidogaster conchicola* (Bær). The intestines of *Neritinæ* are frequently full of entozoa. In *Neritina crepidularia* are found a *Lingricitula*, and also an *Ascaris*. A species of epizoon will attack Limnæi and Helices when in a sickly state, and ultimately destroy them; while a remarkable form, the *Distoma helicis*, was found by Dr. Leidy in the pericardium of *Helix alternata*. A small crustacean, the *Pinnotheros*, lives parasitic in the pearl mussel; and the *Phospuga atrata*, a Silphideous beetle, preys upon the common snail.

Class CEPHALOPODA.

Head large, separate from the body; eyes large, complex, lateral; ears developed; mouth armed with two horny or shelly jaws edged with fleshy lips, surrounded by eight or ten fleshy arms, and furnished with an entire or slit tube or siphuncle used in locomotion. Body ovate, roundish, or cylindrical, open in front, containing the viscera and one or two pairs of internal symmetrical gills; naked; surrounded by a thin shell with a single cavity; or partly or entirely contained in the last chamber of a chambered shell furnished with a siphon passing from chamber to chamber. Individual, unisexual. Animal free, walking on its head, or swimming in the sea, propelled by the water from the siphon tube.

The gills of the Cephalopods are placed within the mantle, to which their stems are attached by a thin membrane; they are two in number, with the exception of the Nautilus, where the gills are four in number, and only united to the mantle by their bases. The Cephalopods are all oviparous, their eggs receiving in their passage from the ovary of the female a gelatinous covering, which swells in the water and prevents their sinking to the bottom.

When the Cephalopods swim, they always move backwards, with the head directed downwards, and the body held nearly in a perpendicular position; they progress with

great velocity, by sudden and irregular jerks. They are carnivorous, ferocious, and greedy, and will even tear pieces from fishes that have swallowed the baited hook, and many will attack and devour small individuals of their own species. "Their warfare," says Dr. Johnston, "though cruel, is open, and they are amply furnished with the necessary weapons. The long flexible arms that encircle the head are furnished with dozens of cup-like suckers, often pointed with sharp curved teeth. It must be a fearful thing for any living creature to come within their compass or within their leap, for, captured by a sudden spring of several feet, made with the rapidity of lightning, and entangled in the slimy serpentine grasp of eight or ten arms, and held by the pressure of some hundreds of exhausted cups, escape is hopeless."

When the Cephalopods are opened in the dark, they are seen to be vividly phosphorescent. Their senses appear to be very acute; their tongue is large and fleshy, and partially armed with recurved spines; their powerful jaws act vertically, like the beaks of birds, and their eyes are large and well developed. The Squids and Cuttles, as they are familiarly termed, are nocturnal or crepuscular in their habits, coming to the surface or near the shore in the night, and concealing themselves by day; they inhabit all parts of the world, and often attain a very considerable size, and their prey is shell-fish, fishes, and crustacea.

The Cephalopods change colour, like the chameleon, by means of thousands of contractile vesicles filled with colouring matter, with which their skin is furnished: when the animal is in repose the vesicles are contracted and invisible; but when excited, they dilate and show themselves, appearing and disappearing with the greatest velocity, forming coloured spots and waves all over the body.

Order OCTOPODA.

Body naked. Head separate, with eight fleshy arms, furnished with sessile cups, without any horny ring; eyes fixed in the skin. Gills two; siphuncle entire. Foot none.

No internal medial dorsal shell.

In this order of Octopods there are only eight arms, the two elongated tentacular arms being wanting; their bodies are rounder than the Decapods, and they are not so amply provided with fins. The only genus furnished with a shell is the Argonaut, the shell, however, has only been found on females, and may possibly serve merely as a receptacle for the ova; when there is an internal shell it is quite rudimentary.

Fam. OCTOPODIDÆ.

Arms subulate. Mantle supported by fleshy bands. No cephalic aquiferous apertures.

In this family, consisting of five genera, the arms are similar, elongated, and united at the base by a web; the shell, according to Professor Owen, is represented by two short styles encysted in the substance of the mantle. In their habits they are chiefly littoral, feeding along the coasts of the temperate and tropical zones: they escape detection by varying their tints according to the nature of the ground over which they pass, and elude the vigilance of their enemies by discolouring the water with an inky cloud, which they pour out of their ink-bag when pursued.

Genus OCTOPUS, Cuvier.

Arms with two rows of cups. Body round, without fins. No aquiferous cells between the bases of the arms.

Ex. O. tuberculatus, *Blainville*, pl. 1, fig. 1.

The Octopus is an excellent swimmer, propelling itself rapidly backwards by repeatedly striking forward the whole of its webbed arms at the same instant; it can walk, likewise, at the rate of seven feet in a minute, and when wishing to accelerate its speed, it inflates the body like a distended bladder, lets go its hold, and rolls over and over with great velocity. The Octopi are held in detestation by the Mediterranean fishermen, on account of the havoc they commit among the most esteemed species of lobsters and crabs, which appear to constitute their favourite food: we have taken bruised bivalves and turbos from the stomachs of tropical species.

Species of Octopus.

aculeatus, *D'Orb.*
Ægina, *Gray.*
aranea, *D'Orb.*
arcticus, *Prosch.*
areolatus, *De Haan.*
Berenice, *Gray.*
Boscii, *Lesueur.*
brevipes, *D'Orb.*
brevitentaculatus, *Blainv.*
cærulescens, *Peron.*
Carena, *Verany.*
Cassiopea, *Gray.*
Cephea, *Gray.*
cocco, *Verany.*
Cuvieri, *D'Orb.*
Cyanea, *Gray.*
didynamus, *Rafin.*
Eudora, *Gray.*
Fang Siao, *D'Orb. and Férus.*
Favonia, *Gray.*
Fontanianus, *D'Orb.*
frayedus, *Rafin.*
Geryonea, *Gray.*
granosus, *Blainv.*
Hardwickei, *Gray.*
heteropodus, *Rafin.*
horridus, *D'Orb.*
Köllikeri, *Verany.*
longipes, *Leach.*
lunulatus, *Quoy and Gaim.*

Species of Octopus—continued.

Medoria, *Gray.*
membranaceus, *Quoy and Gaim.*
ocellatus, *D'Orb. and Férus.*
Peronii, *Lesueur.*
pilosus, *Risso.*
polyzenia, *Gray.*
rugosus, *Bosc.*
Sapheniæ, *Gray.*
Sinensis, *D'Orb. and Férus.*
superciliosus, *Quoy and Gaim.*
Tchuelchus, *D'Orb.*
tetracirrhus, *Delle Chiaje.*
tetradynamus, *Rafin.*
tuberculatus, *Blainv.*
venustus, *Rang.*
vermetus, *Rang.*
vulgaris, *Lam.*

The *Octopus colossus* of Montfort, or *Sepia gigas* of Oken is the Kraken, most probably an apocryphal species.

Genus CISTOPUS, Gray.

Arms with two rows of cups. Body round, without fins. Distinct aquiferous cells between the bases of the arms.

Ex. C. Indicus, *Rüppell*, pl. 1, fig. 2.

The genus Cistopus, of which only a single species is known, has a small aquiferous system, consisting of a bag with a small pore at the outer edge, situated between the bases of the arms, and which serves to extend them; the suckers of the arms are sessile and placed in two rows: they live on rocky coasts.

Genus PINNOCTOPUS, D'Orbigny.

Arms with two rows of cups. Body with fins.

Ex. P. cordiformis, *Quoy and Gaimard*, pl. 1, fig. 3.

This genus is characterized by the broad wing-like expansions which are placed along the sides, extend in front, and enfold all the body; the *P. cordiformis*, the only species at present known, exceeds three feet in length, and was captured by the naturalists of the Astrolabe, on the coast of New Zealand.

Genus ELEDONE, Leach.

Arms with one row of cups; without beards, and united by a short web. Body round.

Ex. E. moschata, *Leach*, pl. 1, fig. 4.

In this genus there is only one series of suckers on the arms; the *E. moschata* exhales a musky odour, which is so strong, that it will scent a whole room whether the animal be dead or alive. They live in rocky places, and feed on crustaceous and molluscous animals.

Species of Eledone.

moschata, *Leach*, octopodia, *Penn.*

Genus CIRRHOTEUTHIS, Eschricht.

Arms with one row of cups, bearded and united by a broad web. Body finned.

Ex. C. Mülleri, *Eschricht*, pl. 1, fig. 5, 5 *a*.

The circumstance of the cups of the arms alternating with cirri, and the existence of the broad web, distinguish this genus; it is remarkable for the extreme length and slenderness of the arms, which are endowed with great sensibility, and must prove very effectual in the capture and retention of their prey. The only species, mentioned above, inhabits the coast of Greenland.

Fam. PHILONEXIDÆ.

Arms subulate. Mantle supported by two buttons at the base of the siphuncle, fitting into grooves in the mantle.

In this family the cups are fleshy and pedunculated, very extensible, and arranged in two rows; the eyes are large and prominent. There is no shell either external or internal; the animals are pelagian, living on the high seas, and are crepuscular or nocturnal, eating floating mollusca. They are gregarious, and are found in the Atlantic and Mediterranean; two genera are at present known.

Genus PHILONEXIS, D'Orbigny.

Arms free, tapering, unequal. Nocturnal.

Ex. P. Eglais, *D'Orbigny*, pl. 1. fig. 6.

The Philonexes during the night, cover the surface of the water in innumerable phalanxes; they inhabit the high seas, and are sociable and gregarious; like the Ommastrephes and Loligines, they are true voyagers, instead of being sedentary like the Octopi properly so called. They avoid the light, change colour, and are very voracious, preying on *Glauci*, *Ianthinæ*, and *Physaliæ*; there are six species known.

Species of Philonexis.

Alcæus, *Gray.*
Atlanticus, *D'Orb.*
Eglais, *D'Orb.*
hyalynus, *Rang.*
microstomus, *Regnaud.*
tuberculatus, *Risso.*

Genus TREMOCTOPUS, Delle Chiaje.

Arms moderate; the two upper pair longest, and webbed nearly to the tip.

Ex. T. Quoyanus, *D'Orbigny*, pl. 1. fig. 7.

This genus derives its name from two large aquiferous pores on the back of the head; the arms are webbed. Like *Philonexis*, *Tremoctopus* feeds on the mollusca of the high seas, coming to the surface at the dusk of evening, and pursuing its prey until the following morning; there are two species known, from the Mediterranean, and the middle of the Atlantic.

Species of Tremoctopus.

Quoyanus, *D'Orb.* violaceus, *Férus.*

Fam. ARGONAUTIDÆ.

Arms subulate. The two upper or dorsal webbed at the extremity, secreting (in the female) a symmetrical involuted shell; mantle supported by two buttons, fitting into grooves at the base of the siphuncle.

The male of the Argonaut is described by M. H. Müller as being much smaller than the female; shell-less, and with the superior arms not expanded as in the female, but pointed. The most curious circumstance, however, is the fact of a part developed within a coloured sac, which occupies the place of the third arm, of the left side; this organ, which is an arm of the animal metamorphosed irregularly, is detached when the seminal fluid formed in the true testes of the Argonaut has been deposited in it, and from this moment it enjoys an apparently independent life, and is the *Hectocotylus* of Cuvier. "The *Hectocotylus* of the Argonaut, is then the arm of a male Argonaut, metamorphosed for the purpose of carrying the semen, and therewith impregnating the female; an arm endowed with so high a

degree of independence, that it truly deserves Cuvier's phrase, 'un ver vraiment extraordinaire.'" (Müller.)

In the young state, according to Madame Power, the female Argonaut resembles a little worm, with two rows of suckers along its length, with a filiform appendage at one extremity, and is without a shell.

Genus ARGONAUTA, Linnæus.

Vide character of family.

Syn. Ocythöe, *Rafinesque.* Nautilus, *Aristotle and Pliny.*

Ex. A. Owenii, *Adams* and *Reeve*, pl. 2. fig. 1. 1, *a.* Shell, A. Argo, fig. 1, *b.*

The shell secreted by the female Argonaut is thin and semipellucid; it is embraced by the webs of the dorsal arms which cover the outer surface and keep it in its place. The animals found in these shells are always females, and the apex of the shell is filled with eggs, upon which they sit as if incubating: it therefore seems probable, that it serves as a nest to contain the ova. The shell is one-celled, brittle, horny, slightly flexible when wet, with a large hemispherical nucleus; there are several species known.

The Argonaut swims with great velocity in a reversed position with the siphuncle directed towards the fore-part and keel of the shell, and the velated arms firmly embracing the sides of the shell; it also crawls along the bottom by the contortions of its simple arms, holding the shell back upwards with the membranous arms which are bent backwards; there is no muscular or organic connection between the animal and shell, which, when vacated by the Argonaut, floats at the mercy of the waves; while in confinement,

at least, the female, deprived of her precious burden, beats herself against the sides of the vessel in which she is placed and shortly dies.

Species of Argonauta.

Argo, *Linn.* (Ocythoë tuberculata, *Rafin.*).
gondola, *Dillw.*
Gruneri, *Dunker.*
hyans, *Soland.* (Ocythoë Cranchii, *Leach*).
oryzata, *Meusch.* (Octopus raricyathus, *Blainv.*).
Owenii, *Adams and Reevé.*

Order DECAPODA.

Body naked. Head separate, with ten fleshy arms, the two longer arms furnished with peduncled cups with a horny circle; eyes free in the orbit. Siphuncle entire; gills two. Foot none. An internal medial shell.

In this order, the two longer arms, sometimes called tentacles, have expanded ends; the eyes are moveable in their sockets, and the body is always provided with a pair of fins. The funnel or siphuncle, is usually provided with an internal valve. The decapods are conveniently divided into those with an internal horny pen (*Chondrophora*); those with a calcareous bone (*Sepiaphora*); and those with an internal chambered calcareous shell (*Belemnophora*).

The long tentacular arms of the Decapodous Cephalopods originate within the circle of the other arms, and are more or less retractile into pouches under the eyes, except in *Cheiroteuthis*, where they are non-retractile. These arms serve to secure their prey when beyond the reach of the ordinary arms, and to moor the animals to floating bodies. In many fossil genera, the chambered shell is combined with the *gladius* or pen, and in some, the internal shell resembles

the apex of the *sepion*, or cuttle-bone. The decapods chiefly frequent the open sea, appearing periodically like fishes in great shoals on the coasts and banks.

Suborder CHONDROPHORA.

Shell internal, solid, horny or cartilaginous, either lanceolate, pennate with a central longitudinal dorsal ridge above, and a groove beneath; or flat, narrow, with a central longitudinal solid rib, and a similar rib on each edge. The apex solid, sometimes thickened, produced, and cartilaginous. In the families *Cranchiadæ*, and *Loligopsidæ*, the mantle is supported by two internal fleshy bands; and in *Cheiroteuthidæ*, *Onychoteuthidæ*, and *Loligidæ*, it is furnished with three internal cartilages, one dorsal and two ventral.

Fam. CRANCHIADÆ.

Eyes covered with the skin. Mantle supported by two internal fleshy bands. Siphuncle with a valve.

Shell solid, horny.

In this family the body is large and membranous, the head is very small; the eyes, which are large and prominent, are covered with a continuous skin, with a small transparent spot; the club of the tentacular arms is finned behind, and has four series of cups; the buccal membranes are large and lobed; the fins of the body are terminal and small.

Genus CRANCHIA, Leach.

Shell horny, as long as the body, narrow, bilanceolate, and pointed at each end.

Ex, C. scabra, *Leach*, pl. 1, fig. 8. Shell, C. scabra, fig. 8, *a*.

In *Cranchia*, the three upper pairs of sessile arms are shortly webbed together; there are two species, both from the Atlantic Ocean. The genus is named in honor of Mr. J. Cranch, naturalist to the Congo Expedition. Both this genus and *Loligopsis* are somewhat allied to the *Octopidæ*; one of the most striking peculiarities is the tentacular club being finned behind.

Species of Cranchia.

maculata, *Leach*. scabra, *Leach*.

Subgen. OWENIA, Prosch.

Sac joined to the neck by a pseudo-articulation.

megalops, *Prosch*.

Fam. LOLIGOPSIDÆ.

Eyes naked. Mantle supported by two internal fleshy bands. Siphuncle simple.

Shell solid, horny.

The members of this family have the eyes peduncled and not covered by a skin; the fins are caudal, terminal, and semicircular; the body is membranaceous, semipellucid, elongate, and tapering behind. They inhabit the high seas and are powerful swimmers.

Genus LOLIGOPSIS, Lamarck.

Arms short, cups in two rows; tentacular arms slender; funnel without a valve. Pen slender, with a minute conical appendix.

Ex. L. cyclura, *Lesueur*, pl: 1, fig. 9. Shell, L. cyclura, fig. 9, *a*.

In this genus, the eyes are very large and beautiful; the head though small, is broad; the buccal membrane is seven lobed without cups, and the siphuncle is very large and notched on the sides. In some species the body is smooth, forming *Loligopsis* proper, in others, the sides have rows of acute tubercles, forming the subgenus *Leachia* of *Lesueur*, or *Perotis* of *Eschscholtz*. There are eight species, from the North Sea, Atlantic, Mediterranean, India, Japan, and the South Sea.

Species of Loligopsis.

ellipsoptera, *Adams and Reeve.*
pavo, *Lesueur.*
vermicolaris, *Rüppell.*
Zygœna, *Verany.*

Subgen. LEACHIA, Lesueur (Perotis, ESCH.)

Sides with rows of acute tubercles. Shell solid at the tip.

cyclura, *Lesueur.*

Doubtful Species.

chrysophthalmos, *D'Orb.*
dubia, *Rathke.*
Peronii, *Lam.*

Fam. CHIROTEUTHIDÆ.

Eyes naked, simple above. Mantle furnished with three internal cartilages, one dorsal, and two ventral. Siphuncle simple, without a valve.

Shell solid, horny.

The fins in this family are on the hinder part of the back; the body is elongate and tapering, the ears are without any crest, the buccal membrane is short, and the tentacular arms are outside the web, and not retractile.

In the first genus, *Chiroteuthis*, the shell is narrow, and rather dilated or winged at each end, and there are scattered cups at the bases of the long tentacular arms; in the second genus, *Histioteuthis*, the shell is lanceolate, and pennate.

Genus CHIROTEUTHIS, D'Orbigny.

Arms free, cartilages of the mantle dilated below; rings of cups contracted in the middle.

Shell, slender, dilated at each end.

Ex. C. Veranyi,' *Férussac*, pl. 2, fig. 2. Shell, C. Veranyi, fig. 2, *a*.

In this genus, the tentacular arms are slender and extremely elongated, with distant sessile cups on the peduncles, and four rows of pedunculated claws on their expanded end. The *C. Veranyi* does not exceed four inches in length, the tentacular arms are two feet and a half, and as slender as a thread, organs admirably adapted to encircle any prey that may be seen floating at a distance and unconscious of the impending danger.

Species of Chiroteuthis.

Bonplandi, *D'Orb.* Veranyi, *Férus.*

Genus HISTIOTEUTHIS, D'Orbigny.

Three upper pairs of sessile arms webbed nearly to the end; cartilages of the mantle linear, elongate; rings of cups convex externally.

Shell broad, pennate.

Ex. H. Bonelliana, *Férussac*, pl. 2, fig. 3. Shell, H. Bonelliana, fig. 3, *a*.

In this genus the body is short, the tentacular arms long, outside the web, with six rows of dentated cups on their ends; the pen is short and broad. The *H. Bonelliana* rivals in colour the brilliancy of the butterflies of tropical suns; the large membrane which unites its arms is of a rich purple, and the suckers are sapphire, the under surface being studded with blue and yellow spots on a reddish ground, sprinkled with purple spots.

Species of Histioteuthis.

Bonelliana, *Férus.* Rüppellii, *Verany.*

Fam. ONYCHOTEUTHIDÆ.

Eyes naked, with a sinus above. Mantle furnished with three internal cartilages, one dorsal, and two ventral. Siphuncle with a valve.

Shell solid, horny.

The fins are posterior, dorsal, and angular; the head is moderate and cylindrical; the eyes naked, with a deep lachrymal sinus at the upper edge; the ears have a well-marked longitudinal crest; the tentacular arms have a rounded group of small sessile cups at the extremity of the club; the shell is internal, horny, lanceolate, and without any air-chambers. These animals are usually termed Squids, and Calamaries; they are gregarious and frequent the open seas of all climates.

Genus ENOPLOTEUTHIS, D'Orbigny.

Fins subterminal, dorsal, rhombic. Tentacular and sessile arms with claw-like hooks. Sessile arms with hooks only.

Shell pennate, lanceolate.

Ex. E. Smithii, *Leach*, pl. 2, fig. 4. Shell, E. Smithii, fig. 4, *a*.

In this genus the tentacular arms are slender, feeble, scarcely clubbed, and armed with hooks only. The shell is pennate, lanceolate, without any appendix at the tip, and the central ridge is narrow, keeled, and produced in front; there are five recent species known, and one fossil, the former from the Mediterranean Sea and Indian Ocean. The natives of the Polynesian Islands have a well-founded dread of these animals on account of the great size they sometimes attain.

Species of Enoploteuthis.

margaritifera, *Rüppell.*
Owenii, *Verany.*
Smithii, *Leach.*
unguiculata, *Molina.*
Verany, *Rüppell.*

Genus ANCISTROCHEIRUS, Gray.

Fins occupying the whole side of the back, rhombic. Tentacular and sessile arms with claw-like hooks. Sessile arms with hooks only.

Shell dilated at each end.

Ex. A. Lesueurii, *Férussac*, pl. 3, fig. 1. Shell A. Lesueurii, fig. 1, *a*.

There are no cups on the arms of *Ancistrocheirus*, and the hooks are in two alternate series. The shell is narrow, lanceolate, slightly convex, with a very broad central groove, and with the ends produced; there is but one species, *A. Lesueurii*, Férussac, from the Indian Ocean.

Genus ABRALIA, Gray.

Fins subterminal. Tentacular and sessile arms with

claw-like hooks. Sessile arms with hooks at the base, and cups at the tip.

Shell lanceolate, concave on the edges.

Ex. A. armata, *Quoy and Gaimard*, pl. 3, fig. 2. Shell, A. armata, fig. 2, *a*.

In *Abralia*, the sessile arms, besides a series of hooks at the base, have a double row of hemispherical cups at the tip; and the tentacular arms have a few long hooks on the club, alternating with a series of cups. The shell is lanceolate, and sinuous at the edge near the tip. There is one species from the Indian Ocean.

Species of Abralia.

armata, *Quoy and Gaim.* Morisii, *D'Orb.*

Genus OCTOPODOTEUTHIS, Rüppell.

Fins on the hind part of the back, roundish. Tentacular and sessile arms with claw-like hooks.

Shell narrow.

Ex. O. Sicula, *Rüppell and Krohn*, pl. 3, fig. 3. Shell, O. Sicula, fig. 3, *a*.

This genus, of which but a single species is known, inhabits the shores of Sicily. The sessile arms are cylindrical and curled at the end, with a double series of small nearly sessile subcylindrical cups armed with short curved hooks; the tentacular arms are very short, with a small club; the shell is cartilaginous, very slender, and as long as the back. It is the same as the *Verania* of Krohn.

Genus ONYCHOTEUTHIS, Lichtenstein.

Club of tentacular arms with claw-like hooks and cups. Sessile arms with cups and rings.

Shell lanceolate, pennate, sides thin.

Ex. O. Banksii, *Leach*, pl. 3, fig. 4. Shell, O. Banksii, fig. 4, *a*.

A remarkable mechanical contrivance exists in the *Onychoteuthis*, one of the most formidable of Cephalopods. At the extremities of the long tentacular arms, besides the hook-armed cups, there is a cluster of simple unarmed suckers at the base of the expanded part. "When these latter suckers," says Owen, "are applied to one another, the tentacles are firmly locked together at that part, and the united strength of both the elongated peduncles can be applied to drag towards the mouth any resisting object that has been grappled by the terminal hooks."

Species of Onychoteuthis.

Banksii, *Leach.* Bartlingii, *Lesueur.*
Kamtschatica, *Midd.*

Genus ANCISTROTEUTHIS, Gray.

Tentacular arms with hooks. Sessile arms with cups and rings. Club of tentacular arms with hooks only.

Shell narrow, rather dilated in front, with one central and two marginal ribs.

Ex. A. Lichtensteinii, *Férussac*, pl. 3, fig. 5. Shell, A. Lichtensteinii, fig. 5, *a*.

Three species of this genus are known; one, with the body shagreened, from the Indian Ocean. The shell is horny, linear, very narrow, gradually widening towards the fore part, the sides are thickened on the edge, and the apex is long, conical, horny, and obliquely produced.

Species of Ancistroteuthis.

Dussumieri, *D'Orb.* Krohnii, *Verany.*
Lichtensteinii, *Férus.*

Genus ONYCHIA, Lesueur.

Tentacular arms with hooks. Sessile arms with cups and rings. Club of tentacular arms with hooks on the centre, and with two rows of small cups on each side.

Shell lanceolate, pennate.

Ex. O. platyptera, *D'Orbigny*, pl. 3, fig. 6. Shell, O. platyptera, fig. 6, *a*.

In *Onychia* the body is red and spotted; the tentacular arms are scarcely enlarged at the ends. Like most other genera of this family, and other pelagic forms, it is crepuscular, darting along the surface of the ocean towards nightfall, and preying upon small fishes, floating crustacea, and acalephæ that swim near the surface.

Species of Onychia.

cardioptera, *Péron.* platyptera, *D'Orb.*

Genus OMMASTREPHES, D'Orbigny.

Tentacular and sessile arms with cups and horny rings. Fins rhombic, posterior, caudal. Internal cartilage of mantle dilated below.

Shell narrow, dilated in front, with one central and two marginal ribs.

Ex. O. Bartramii, *Lesueur*, pl. 4, fig. 1. Shell, O. Bartramii, fig. 1, *a*.

The sessile arms have two rows of suckers, and some-

times an internal membranous fringe, and the shell has a hollow conical appendix. These, which are called sagittated Calamaries, live in the high seas in large troops; they are nocturnal in their habits, and form the food of cetacea and pelagic birds. The sailors call them "sea-arrows" or "flying-squids," from their habit of leaping out of the water, often to such a height as to fall on the decks of vessels.

Species of Ommastrephes.

æquipoda, *Rüppell.*
Bartramii, *Lesueur.*
Eblanæ, *Ball.*
giganteus, *D'Orb.*
Oualaniensis, *Lesson.*
sagittatus, *Lam.*
Sloanii, *Gray.*
todarus, *Rafin.*

Sub-gen. HYALOTEUTHIS, Gray.

Body transparent, tubercular beneath; one or two cups on the second pair of sessile arms larger than the others.

pelagicus, *Bosc.*

Doubtful Species.

Arabicus, *Ehrenb.*
Bianconii, *Verany.*
laticeps, *D'Orb.*
Meneghinii, *Verany.*

Fam. LOLIGINIDÆ.

Eyes covered with skin, simple. Mantle with three internal cartilages, one dorsal and two ventral.

Shell solid, horny.

In this family the fins are on the sides of the hinder part of the back; the eyes are without eyelids and covered with the skin; the buccal membrane is often furnished with cups; the ears have a transverse ridge; the sessile

arms have two rows of cups, the rings provided with a narrow prominent ridge on the centre of the external surface; the tentacular arms are only partly contractile into the sub-ocular cavity, and the siphuncle is attached to the head by a double superior medial band.

Genus GONATUS, Gray.

Head separate from the body. Mantle free all round. Fins posterior, dorsal, rhombic. Cups of sessile arms in four rows. Tentacular arms with many rows of small cups, and a single hooked cup at the base.

Shell as long as the back, pennate, edges thin.

Ex. G. amœna, *Möller*, pl. 4, fig. 2.

In *Gonatus* the eyes are large, covered by the skin, with a small transparent spot; the cups on the sessile arms are small, conical, contracted at the top, nearly uniform in size, and in four series; the club of the tentacular arms is compressed, and finned at the tip. The shell is horny, thin, lanceolate, pennate, narrowed and extended in front: there is one species, *G. amœna*, from Greenland.

Genus LOLIGO, Lamarck.

Head separate from the body. Mantle free all round. Cups of sessile arms in two rows; lateral membranes with cups on the angles. Fins posterior, dorsal, rhombic.

Shell as long as the back, pennate, edges thin.

Ex. L. magna, *Rondeletius*, pl. 4, fig. 3. Shell, L. magna, fig. 3, *a*.

The rings of the suckers are horny and dentated, and the tentacular club has four rows of cups. The *Loligo* pursues its prey on the bosom of the ocean, and swims

with great rapidity; fish and pelagic crustaceans, Ianthinæ, and other oceanic mollusca, constitute its food; many individuals frequently unite and hunt in companies, their favourite time for scouring the surface being the evening after sunset.

The *Loligo magna*, the common species, is the favourite food of the cod, and with it one half of all the cod taken at Newfoundland is caught. When the vast shoals of this mollusk approach the coast, hundreds of vessels are ready to capture them, forming an extensive cuttle-fish fishery, engaging five hundred sail of French and English ships. During violent gales of wind hundreds of tons of them are often thrown up together in beds on the flat beaches, the decay of which spreads an intolerable effluvium around (Johnston). The *L. magna* is also used for bait by fishermen on our own coast, under the name of "squid." Its egg-cluster has been estimated to contain forty thousand eggs. The *Loligines* are found in all seas, and the species are numerous.

Species of Loligo.

Alessandrinii, *Verany.*
australis, *Gray.*
Brasiliensis, *Blainv.*
brevis, *Blainv.*
Chinensis, *Gray.*
Duvaucelii, *D'Orb. and Férus.*
Emmakina, *Gray.*
Gahi, *D'Orb.*
Hardwickei, *Gray.*
magna, *Rondelet.*
neglecta, *Gray.*
Pealii, *Blainv.*
Plei, *Blainv.*
Reynaudii, *D'Orb. and Férus.*
tricarinata, *Gray.*

Doubtful species.

carunculata, *Schneider.*
lanceolata, *Rafin.*
minima, *D'Orb.*
Osogadium, *Rafin.*

Genus TEUTHIS, Aristotle.

Head separate from the body. Mantle free all round. Cups of sessile arms in two rows; lateral membranes without cups. Fins posterior, dorsal, rhombic.

Shell as long as the back, pennate, edges thin.

Ex. T. parva, *Rondeletius*, pl. 4, fig. 4. Shell, T. parva, 4, *a*.

In *Teuthis* the body is elongate and acute behind; the fins are rather behind the middle of the sides of the back, forming together a heart-shaped expansion; the labial membrane is simple, not produced into angular lobes, and destitute of any cups; the shell is lanceolate and narrow. There are two species, one from the European, the other from the Indian Seas.

Species of Teuthis.

parva, *Rondelet.* Sumatrensis, *D'Orb. and Férus.*

Genus SEPIOTEUTHIS, Férussac.

Head separate from the body. Mantle free all round. Fins occupying the sides of the body.

Shell as long as the back, pennate, broad, edges sometimes thickened.

Ex. S. Blainvilliana, *D'Orbigny and Férussac*, pl. 4, fig. 5. Shell, S. Blainvilliana, fig. 5, *a*.

In most respects *Sepioteuthis* resembles *Loligo*, but the fins are lateral, and as long as the body; the external ear is furnished with a transverse crest, enlarged and curved up in front; the sessile arms are conical, subulate, unequal, and externally finned, with the cups in two series. There are about twelve species, chiefly from the Indian Seas.

Species of Sepioteuthis.

australis, *Quoy and Gaïm.*
bilineata, *Quoy and Gaim.*
Blainvilliana, *D'Orb. and Férus.*
Hemprichii, *Ehrenb.*
Lessoniana, *Férus.*
lunulata, *Quoy and Gaim.*
Madagascariensis, *Gray.*
major, *Gray.*
Mauritiana, *Quoy and Gaim.*
sepioïdea, *Blainv.*
Sloanii, *Leach.*

Sub-gen. CHONDROSEPIA, Leuckart.

Fins most dilated behind the middle of the body.

loliginiformis, *Leuck.*

Genus ROSSIA, Owen.

Head separate from the body. Mantle free all round. Fins short, on the middle of the sides of the back.

Shell shorter than the back.

Ex. R. macrosoma, *Delle Chiaje*, pl. 4, fig. 6. Shell, R. macrosoma, fig. 6, *a*.

Rossia, established by Owen, and named in honour of Sir John Ross, differs from *Sepiola* in the head being separate from the body, and the mantle free all round; the suckers, moreover, on the tentacular arms are in two rows. One species inhabits the Mediterranean, two have been taken on our coasts, one is from the North Sea, and another from the Indian Ocean.

Species of Rossia.

macrosoma, *Delle Chiaje.*
palpebrosa, *Owen.*
subulata, *Eyd.*

Sub-gen. HETEROTEUTHIS, Gray.

Cups of three pairs of lateral arms very large, peduncled, distant; cups of other arms small, crowded, equal. Tentacular arms tapering.

dispar, *Rüppell.*
Owenii, *Ball.*
Jacobi, *Ball.*

Genus SEPIOLA, Rondeletius.

Head attached to the back of the mantle by a broad cervical band. Fins short, in the middle of the sides of the back. Cups of sessile arms nearly sessile.

Shell narrow, with one central and two marginal ribs.

Ex. S. Atlantica, *D'Orbigny and Férussac*, pl. 4, fig. 7. Shell, S. Atlantica, fig. 7, *a*.

The body of this genus is round and purse-like, and the short dorsal fins are rounded and contracted at the base. These small Cuttles are found in various seas; the shores of Britain acknowledge one, one is from Japan, another from the Mauritius, one from New Holland, and another from the Atlantic Ocean.

Species of Sepiola.

Atlantica, *D'Orb. and Férus.*
Japonica, *D'Orb. and Férus.*
Oweniana, *D'Orb. and Férus.*
Rondeletii, *Gesner.*
stenodactyla, *Grant.*

Sub-gen. SEPIOLIDEA, D'Orbigny.

Body and head tubercular beneath; internal cartilage of mantle broad, contracted in the middle.

lineata, *Quoy and Gaim.*

Genus FIDENAS, Gray.

Head attached to the back of the mantle by a broad cervical band. Fins short, in the middle of the sides of the back. Cups of sessile arms very longly peduncled.

Shell narrow, with a central and two marginal ribs.

Ex. F. Penares, *Gray*, pl. 5, fig. 1.

This genus has been established by Mr. Gray on a specimen in spirits in the British Museum. The long peduncles of the cup-like suckers, which peduncles are suddenly contracted and very thin near the cups, serve principally to distinguish it from *Sepiola*; it is from Singapore.

Sub-order SEPIOPHORA.

Head united to the mantle by a broad cervical band. Mantle attached behind, free in front, and with two internal cartilaginous longitudinal ridges fitting into cartilaginous grooves at the base of the sides of the siphuncle. Fins as long as the sides of the back.

Shell cellular, calcareous; back hard; cavity filled with laminæ separated by numerous cells.

This sub-order comprises the Cuttles properly so called; they live near the shore, and the mucro of their shell seems to protect them in the frequent collisions they are exposed to in swimming backwards.

Fam. SEPIIDÆ.

Eyes covered with skin. Head united to the mantle by a broad cervical band. Mantle with two cartilaginous ridges on the ventral side.

Shell cellular, calcareous.

In the Cuttle-fishes, the animal has elongated tentacular arms, expanded at their ends; the body is oval, or rounded, and depressed; the lower eyelid is distinct; the buccal membrane is without cups; the sessile arms have four rows of cups; the horny rings of the cups are convex, without any external ridges; the tentacular arms are entirely retractile into the cell at their base; the siphuncle is furnished with an internal valve; and the shell is filled with irregular cells, without any siphon.

Genus SEPIA, Plinius.

Body oblong, with lateral fins as long as itself.

Shell as wide and long as the body, very thick in front, concave internally behind, terminating in a prominent mucro.

Ex. S. officinalis, *Linnæus*, pl. 5, fig. 2. Shell, S. officinalis, fig. 2, *a*.

The Cuttles sometimes attain to an enormous size; the cuttle-bone was formerly used by apothecaries as an antacid. Dr. Mason Good asserts that the *Sepiæ* aid and regulate their motions by the power they have of introducing, at option, air into the numerous cells of the backbone, and thus, at will, varying their proportionable weight to the water in which they live: they comprise numerous species, and inhabit all seas.

Species of Sepia.

aculeata, *Van Hasselt.*
Apama, *Gray.*
Bertheloti, *D'Orb. and Férus.*
elongata, *D'Orb. and Férus.*
gibbosa, *Ehrenb.*
Hierredda, *Rang.*
latimana, *Quoy and Gaim.*
Lefebrei, *D'Orb.*
Lycidas, *Gray.*
officinalis, *Linn.*

plangon, *Gray.*
Rouxii, *D'Orb.*
rupellaria, *D'Orb. and Férus.*
Savignii, *Blainv.*
Sinope, *Gray.*
tuberculata, *Lam.*
vermiculata, *Quoy and Gaim.*
Vicellius, *Gray.*

Sub-gen. SEPIELLA, Gray.

Shell oblong, posterior end expanded, produced, cartilaginous, not beaked, convex beneath.

Capensis, *D'Orb.*
elegans, *D'Orb.*
Indica, *D'Orb. and Férus.*
Mestus, *Gray.*
microchèira, *Gray.*
Myrsus, *Gray.*
Orbignyana, *Férus.*
ornata, *Rang.*
rostrata, *D'Orb.*
Sinensis, *D'Orb.*

Doubtful Species.

Antillarum, *D'Orb.*
mucronata, *Rafin.*

Sub-order BELEMNOPHORA.

Shell calcareous, internal, chambered; chamber traversed by a siphon.

The greater number of genera in this sub-order are fossil, as the *Beloptera* and *Spirulirostra*, which have the apex of the shell enveloped in a thickened lamellar coat produced behind; the *Conoteuthis*, which has a strong longitudinal keel on the middle of the back; the *Belemnoteuthis*, where the shell is thin and conical, and covered with an external coat; *Actinocamax*, where the coat is produced, forming a cylindrical style with its cavity fissured; and *Belemnites*, in which the conical cavity of the style is entire and without any fissure.

Fam. SPIRULIDÆ.

Eyes covered with the skin, with a lower eyelid. Buccal membrane without cups. Sessile arms triangular, tapering. Cups numerous, equidistant, very small, slightly pedicelled, in six longitudinal series. Tentacular arms elongate, peduncled, cylindrical; club— ?. Siphuncle conical, with an apical valve.

Body subcylindrical, oblong, end rounded, sometimes furnished with a thickened belt, and with a small fleshy semilunate fin on each side. Mantle free all round; cartilage, on the inner side of the ventral surface, linear.

Shell internal, shelly, spiral, chambered; chambers furnished with a siphon; the last chamber large enough to contain but a very small part of the animal.

In the only recent genus, *Spirula*, the apex of the shell is simply hooked; in the fossil genera it is enveloped in a thickened laminal coat produced behind, as in *Spirulirostra*.

Genus SPIRULA, Lamarck.

Fins two, small, caudal, on the side of the extremity of the back. Eyes large. Cups of sessile arms in six longitudinal rows; rings entire, or very minute, and denticulated; third and fourth arms shortly webbed, the rest free. Siphuncle with an apical valve.

Shell calcareous, cylindrical, conical, tapering, involute on the same plane, the whorls separate from each other, and chambered; septa concave outwards, with a shelly funnel-shaped siphon on the inner or most curved side, traversing each cell without communicating with each other.

Ex. S. lævis, *Gray*, pl. 5, fig. 3. Shell, S. prototypus, *Péron*, fig. 3, *a*.

The shell is placed vertically in the posterior part of the body, with the involute spire towards the ventral side. The last chamber is not larger in proportion than the rest; its margin is organically connected; it contains the ink-bag (Woodward). In its habits, *Spirula* is, probably, pelagic, swimming near the surface in calm weather, preying on small acalephæ towards the evening, and sinking below the surface during the day. Although the shell has been long well known, and is found scattered by thousands on the shores of New Zealand, only one perfect specimen has been met with, brought home from New Zealand by Mr. Earl, and figured by Mrs. Gray, in the "Annals and Magazine of Natural History." M. De Blainville described an imperfect specimen sent home by M. Péron; Mr. Crouch procured a fragment; and an injured specimen was obtained during the voyage of H.M.S. "Samarang," and served Professor Owen for an elaborate memoir of its anatomy.

Species of Spirula.

prototypus, *Péron.*

Sub-gen. LITUUS, Brown.

Posterior part of the body furnished with a circular disc covering and concealing the shell, and with semicircular fin-like appendages on each side.

lævis, *Gray.* reticulata, *Owen.*

Order POLYPODA.

Body without fins, enclosed in the last chamber of a siphon-chambered external shell. Head not separate

from the body, with a great number of cylindrical, annulated, retractile tentacles, without cups. Gills four. Siphuncle slit. Foot-like appendage distinct.

This order is the same as the *Tetrabranchiata* of Owen; the only recent genus is *Nautilus;* the rest are fossil, and comprise a large number of highly interesting forms, which must formerly have played an important part in the malacological history of our planet.

Fam. NAUTILIDÆ.

Head retractile within the mantle. Eyes pedunculated. Mandibles calcareous. Body attached to the shell by adductor muscles, and by a continuous horny girdle.

Shell external, camerated or many-chambered, and siphuncled; the inner layers and septa nacreous, the outer layers porcellanous; sutures simple; aperture simple.

This family contains the only living representative of the Cephalopods belonging to the present order, the remainder, comprising numerous families and genera, and upwards of one thousand four hundred species, are now extinct. The generic characters and peculiarities of these forms are well and clearly pointed out in Mr. S. P. Woodward's valuable "Treatise on Recent and Fossil Shells," a work of which we have frequently availed ourselves.

Genus NAUTILUS, Breynius.

Shell involute or discoidal, few-whorled; siphuncle central; septa dividing the chambers simple; inner surface pearly.

Ex. N. Pompilius, *Linnæus*, pl. 5, fig. 4. Shell, N. Pompilius, fig. 4, *a*.

The dorsal pair of tentacles is considered to be expanded, forming the hood which closes the aperture of the shell; the tentacles are lamellated on their inner surface, and are retractile within sheaths which correspond to the eight ordinary arms of the cuttle-fishes. Besides these, there are four ocular tentacles, which are supposed by Professor Owen to be instruments of sensation, like the tentacles of *Doris* and *Aplysia*; there are, moreover, four groups of labial tentacles, twelve or thirteen in each group, which appear to answer to the buccal membrane of the dibranchiate Cephalopods; the mandibles are surrounded by a fleshy lip. The respiratory funnel, or siphuncle, is formed by the folding of a thick muscular lobe; behind the hood, or foot-like appendage, it forms an expansion which covers the black part of the shell. The habits of the Nautilus are not well known; most probably, like the *Octopus*, it feeds upon crustacea, and crawls along the bottom of the sea, seeking concealment in rocky places; the tips of the parrot-like mandibles are hardened and calcareous, and are well adapted to crush the hard shells of crabs and other crustacea. A few specimens only have been taken in a perfect state.

Species of Nautilus.

ambiguus, *Sow.*
macromphalus, *Sow.*
perforatus, *Conrad.*
Pompilius, *Linn.*
stenomphalus, *Sow.*
umbilicatus, *Lister.*

Class PTEROPODA.

Head more or less distinct; eyes none; mouth often furnished with cup-shaped appendages. Fins two on the sides of the mouth; or two, or rarely four, on the side of the body between the head and abdomen, often furnished with a small intermediate lobe between them, apparently the rudiment of the foot of Gasteropods. Body ovate or roundish, often enclosed in a thin, conical, cylindrical, or subglobular shell, with a transverse contracted mouth. Individual unisexual? Animal free, floating on the surface of the sea by the assistance of its fins. Nocturnal or crepuscular.

The Pteropods inhabit the high seas, floating constantly in the water by means of a pair of lateral fins. They are extremely vivaceous in their movements, and are frequently associated together in prodigious numbers. The form of their shells is very varied, being globular, subulate, hemispherical, pyramidal, or spiral, but always thin, glassy, and transparent. Lovén compares the fins on the side of the head to the fins on the side of the head of the fœtal or first-hatched fry of Gasteropods, which are sometimes retained in the form of a fringe on each side of the body in the adult animal, as in *Turbo* and *Trochus*. In the cup-shaped disks or suckers which many of them have affixed to the arms that surround the mouth, they show

their affinity to the Cephalopods. The Pteropods, like many of the Cephalopods, are crepuscular in their habits, sinking at sunrise into the bosom of the deep, and coming again to the surface on the approach of evening. According to the observations of M. D'Orbigny, the smaller species of *Cavolina* first appear as evening advances; small species of *Clio* then rise in company with other *Cavolinæ* and *Atlantæ;* after sporting a few hours the lesser species descend and disappear, the larger follow, and towards midnight hardly one remains; after sunrise not a single Pteropod can be seen. Each species has its own time of rising and going down, which causes M. D'Orbigny to infer that each species dwells habitually in the water at a depth peculiar to itself. As the sun rises the Pteropod sinks lower and lower, until it has reached its greatest descent, but as the sun goes down the Pteropod passes gradually upwards until the surface is gained. M. D'Orbigny gives the following as the result of his observations of the geographical distribution and habits of these animals. Of the twenty-nine species which he has observed, fourteen are equally common to all the seas, at least to the Atlantic and Pacific Oceans; eleven have been observed only in the Atlantic, and four in the Pacific. Seventeen of the twenty-nine species are entirely nocturnal and eleven are crepuscular. The Pteropods swim rapidly by ceaseless movements of their wing-like fins, which has caused them to be styled the butterflies of the deep; they are carnivorous, feeding on minute crustacea and medusæ. In their zoological arrangement they are naturally divided into those with, and those without, a shell, or *Thecosomata* and *Gymnosomata;* in the former, the head is not distinct and the gills are internal; in the latter, the head is distinct and the gills external.

The true position in a natural arrangement of this curious

class of beings is at present not very well-defined. On account of the arms and suckers in certain genera, and from a belief that the intermediate lobe, which in *Spirialis* and *Heterofusus* bears the operculum, represents the foot, we have preferred to follow Cuvier and Rang in placing them between the Cephalopods and Gasteropods; Lamarck conceived they should be between the Gasteropods and Bivalves; M. Blainville maintained they were a tribe of Gasteropods allied to the *Bullidæ*, and this opinion has recently been supported by M. Souleyet.

Order THECOSOMATA.

Head indistinct, with two wings on the sides of the mouth. Tooth of lingual membrane hooked, with a strong hooked tooth on each side. Gills internal. Body inclosed in a shell.

This order may be divided into two sub-orders, including those with the body and shell straight, or globular, and without an operculum; and those with the animal and shell spiral, and with a spiral operculum. The families *Cavolinidæ* and *Tripteridæ* have calcareous shells, while in *Cymbuliidæ* the shell is cartilaginous; the second sub-order contains the single family *Limacinidæ*.

Fam. CAVOLINIDÆ.

Animal with two united fins without any posterior foot-like appendage between them. Abdomen voluminous. Gills in pairs. Internal superior organs of generation on the right side.

Shell calcareous, symmetrical, elongate, or globular.

In the genera *Cavolina* and *Diacria* the shell has a

lateral slit emitting the mantle, while in the genera *Clio*, *Balantium*, and *Styliola* the shell is without any lateral fissure; *Vaginella*, *Thëca*, and *Conularia* are fossil genera.

Genus CAVOLINA, Giöeni.

Body short, sometimes furnished with lateral appendages.

Shell globular; mouth narrower than the internal cavity, with a lateral slit on each side, interrupted in front.

Syn. Tricla, *Retzius.* Rheda, *Humph.* Hyalæa, *Lamck.* Hyalus, *Fror. and Meck.* Caulina, *Poli.* ? Archonta, *Montf.* ? Glandiolus, *Montf.*

Ex. C. tridentata, *Forskal*, pl. 6, fig. 1. Shell, C. tridentata, fig. 1, *a*.

The shells of this genus are globular, with the lateral fissures extending nearly the whole length, and the appendices short and directed backwards. The *Cavolinæ* swim by means of their lateral fins, and when touched retract them and fall to the bottom.

Species of Cavolina.

affinis, *D'Orb.*
angulata, *Eyd. and Soul.*
flava, *D'Orb.*
gibbosa, *Rang.*
globulosa, *Rang.*
inflexa, *Lesueur.*
labiata, *D'Orb.*
limbata, *D'Orb.*
longirostris, *Lesueur.*
pisum, *Mörch.*
quadridentata, *Lesueur.*
teniobranchia *Péron.*
tridentata, *Forsk.*
uncinata, *Rang.*

Genus DIACRIA, Gray.

Body short, sometimes with lateral appendages.

Shell globular; mouth narrower than the cavity, with a slit on each side, not interrupted in front; apex often truncated in the adult.

Syn. Hyalæa, *b*, *Rang.*

Ex. D. mucronata, *Quoy and Gaimard*, pl. 6, fig. 2. Shell, D. trispinosa, *Lesueur*, fig. 2, *a*.

This genus consists of those forms which are elongated, with the lateral fissures short, and the appendices produced. They have the same habits as *Cavolina*, and are found in all the seas of the torrid zone and in many of those of the temperate zones.

Species of Diacria.

depressa, *D'Orb.*
lævigata, *D'Orb.*
mucronata, *Quoy and Gaim.*
trispinosa, *Lesueur.*

Genus CLIO, Browne.

Animal elongate, conical, without lateral appendages. Fins expanded, united behind, without any small intermediate lobe.

Shell elongate, angular, conical; mouth larger than the cavity, without any lateral slits.

Syn. Cleodora, *Péron and Lesueur.*

Ex. C. pyramidata, *Browne*, pl. 6, fig. 3. Shell, C. pyramidata, fig. 3, *a*.

The shells of the genus *Clio* are pyramidal and tapering, with prominent spines at the fore part; *C. cuspidata* is one of the most beautiful of the Pteropods, and is armed with three very long spines.

Species of Clio.

pyramidata, *Browne.*
cuspidata, *Bosc.*
deluciana, *Rang.*
Lamartinieri, *Rang.*
compressa, *Eyd. and Soul.*
Chaptalii, *Eyd. and Soul.*

Sub-gen. PLEUROPUS, Eschscholtz.

Sides of the mantle with elongated tentacular processes. Shell conical.

pellucida, *Eschsch.*

Genus BALANTIUM, Leach.

Shell triangular, depressed, transverse, waved; mouth oblong, narrow, oblique, without any lateral slits.

Ex. B. recurvum, *Children*, pl. 6, fig. 4. Shell, B. recurvum, fig. 4, *a*.

Balantium has a simple conical shell, curved at the end, and compressed from before backwards; *B. recurvum*, one of the handsomest of Pteropods, has a steady mode of swimming by lateral movements of the fins, and does not flit about in the water in such a lively manner as the *Cavolinæ*. They are met with only in small numbers at a time, and do not make their appearance until after sunset.

Species of Balantium.

australe, *D'Orb.*	recurvum, *Children.*
inflatum, *Eyd. and Soul.*	rugosum, *D'Orb.*

Genus STYLIOLA, Lesueur.

Body elongate, conical, rounded.

Shell elongate, conical, subcylindrical; mouth larger than the cavity, without any lateral slits.

Syn. Cresis, *Rang.* Crisia, *Menke.*

Ex. S. subulata, *Quoy and Gaimard*, pl. 6, fig. 5. Shell, S. subulata, fig. 5, *a*.

These little animals, remarkable for their subulate glassy shells with a produced point or style, are found in the middle of the ocean associated with *Cavolinæ* and *Clio;* they are often cast up dead along the shore, which they line at high water-mark with incredible numbers of needles of glass.

They have been stated by M. Rang to cluster occasionally on the Gulf weed, by embracing the leaves and stalks with their fins, a circumstance, however, which has not been confirmed by D'Orbigny. One of the authors has observed them during a calm in the Atlantic, towards the decline of day, shining near the surface like myriads of glassy spicula; they often remain poised and motionless, and their progression through the water is very irregular. There are five recent and six fossil species.

Species of Styliola.

corniformis, *D'Orb.*
recta, *Lesueur.*
striata, *Rang.*
subulata, *Quoy and Gaim.*
virgula, *Rang.*

Fam. TRIPTERIDÆ.

Animal with the body elongate, cylindrical, divided into two distinct parts; the front part with two large lateral wings, united below to a flat central portion; the abdominal part cylindrical.

Shell cylindrical or subangular near the mouth, ending in an acute point, separated from the anterior cavity by an entire transverse septum; the tip is often deciduous in the adult.

This family, according to M. D'Orbigny, is intermediate

between *Clio* and *Pneumodermon*, and consists of but a single genus.

Genus TRIPTERA, Quoy and Gaimard.

See characters of the family.

Ex. T. columnella, *Rang*, pl. 6, fig. 6. Shell, T. columnella, fig. 6, *a*.

This genus, which was not very fully described by M. Quoy, is the same as the *Cuvieria* of Rang, the denticulate margin mentioned by the first observer must have been caused by fracture, and the figure in the "Voyage of the Astrolabe" represents the animal without the shell: there are four recent species.

Species of Triptera.

columnella, *Rang.*
oryza, *Benson.*
rosea, *Quoy and Gaim.*
urceolaris, *Mörch.*

Fam. CYMBULIIDÆ.

Animal globular or ovate. Fins two, horizontal, opposite, on each side of the mouth, with a small intermediate lobe.

Shell cartilaginous, slipper-shaped, rarely wanting.

This family comprises four singular pelagic genera with membranous or cartilaginous shells, excepting *Tiedemannia*, which does not appear to possess any membranous envelope.

Genus CYMBULIA, Péron and Lesueur.

Fins large, rounded, with a small, elongate, intermediate lobe.

Shell gelatino-cartilaginous, oblong, slipper-shaped, covered with a thin scarcely visible membrane; mouth elongate, truncated in front.

Ex. C. proboscidea, *Péron and Lesueur*, pl. 6, fig. 7.

There are three species of this genus known; the shells are slipper-shaped and variously spined, and of a firm gelatinous consistence. During the day they must occasionally descend to considerable depths, one having been brought up attached to the thermometer of a sounding-line during the voyage of Her Majesty's ship "Samarang," from one hundred and fifty fathoms in the South Atlantic.

Species of Cymbulia.

ovata, *Quoy and Gaim.* radiata, *Quoy and Gaim.*
proboscidea, *Péron and Lesueur.*

Genus EURIBIA, Rang.

Animal globular; wings two, horizontal, opposite, on each side of the mouth, and with a small intermediate lobe.

Shell cartilaginous or membranous, thin, transparent, regular, shaped like a hood; mouth round, spread out.

Ex. E. Gaudichaudii, *Eydoux and Souleyet*, pl. 6, fig. 8.

The shell of this beautiful little Pteropod is membranous and hemispherical, and the intermediate lobe of the animal small and triangular: three species only appear to be known. M. D'Orbigny, who never met with this genus, imagines it to be the carapace of some crustacean.

Species of Euribia.

Gaudichaudii, *Eyd. and Soul.* Norfolkensis, *Quoy and Gaim.*
hemispherica, *Rang.*

Genus PSYCHE, Rang.

Body free, membranous, without any distinct head; tentacles none; wings two, lateral, elongate, without any intermediate lobe.

Shell very thin and membranaceous.

Ex. P. globulosa, *Rang*, pl. 7, fig. 1.

This genus, established by M. Rang, has a cup-shaped, membranous shell, and long lateral fins, but the animal wants the intermediate lobe; it is found in the sea near Newfoundland.

Genus TIEDEMANNIA, Delle Chiaje.

Body gelatinous, transparent; neck elongated; tentacles two, wings very large, cuneate, forming a disk; mouth below, surrounded by the lips.

Shell none.

Ex. T. Neapolitana, *Delle Chiaje*, pl. 7, fig. 2.

This curious genus of Delle Chiaje has a transparent gelatinous body, two tentacles, and two large wing-like expansions which unite and form a disk; it very much resembles a *Cymbulia* without a shell: there are two species known, one from the Bay of Naples, and the other from New Holland.

Species of Tiedemannia.

Neapolitana, *Delle Chiaje.* punctata, *Quoy and Gaim.*

Fam. LIMACINIDÆ.

Animal elongate, spiral; the head indistinct; mouth at the union of the two fins and intermediate lobe, with two small labial swellings; two fin-like expansions, elongate, rounded, and united at their base by an intermediate lobe bearing an operculum. Mantle large, open in front, forming a large gill cavity; gills internal; vent on right side of mantle.

Shell spiral, transparent.

Operculum distinct, spiral, vitreous, of few whorls.

These animals have been confounded by M. D'Orbigny with the genus *Atlanta*, among the nucleobranchiate Gasteropods, which, however, have a compressed foot with a sucker on the hinder edge, a distinct head, and no lateral fins. The *Steira* of Eschscholtz, which he referred to this family, is a badly observed and badly figured *Atlanta*; the *Cirropteron* of Sars is, according to the observations of Allman, the larva of *Buccinum undatum*; and the *Bellerophina* of Forbes is the shell of the larva of various Gasteropods.

Genus LIMACINA, Cuvier.

Shell subglobose, subdiscoidal, sinistral; spire slightly raised; the last whorl with an obscure keel; axis umbilicated, keeled on the edge.

Operculum —?

Syn. Spiratella, *Blainv.*

Ex. L. arctica, *O. Fabricius*, pl. 7, fig. 3. Shell, L. arctica, fig. 3, *a*.

The only species of this genus known, *L. arctica*, according to Scoresby, is extremely abundant in the North Seas, but rarely met with out of sight of land; it forms an important item in the diet of the whale. The operculum, if it exists in this genus, has not yet been observed.

Genus SPIRIALIS, Eydoux and Souleyet.

Shell thin, vitreous, discoidal, depressed, sinistral; axis umbilicated; whorls smooth; aperture angulated below or canaliculated, sometimes prolonged into a spine-like curved beak.

Operculum glossy, thin, transparent, of few whorls, with a central muscular scar.

Syn. Heliconoides. *D'Orb.*

Ex. S. ventricosa, *Eydoux and Souleyet*, pl. 7, fig. 4. Operculum, S. ventricosa, fig. 4, *a*. Shell, S. rotunda, *D'Orbigny*, fig. 4, *b*.

Although this genus reminds one very forcibly of the larval form of the Gasteropods, it is, from the animal, a true Pteropod; it may be known from the shell of the very young *Atlanta* and *Carinaria* by being sinistral.

Species of Spirialis.

australis, *Eyd. and Soul.*
inflata, *D'Orb.*
Jeffreysii, *Forbes and Hanley.*
rotunda, *D'Orb.*
ventricosa, *Eyd. and Soul.*

Genus HETEROFUSUS, Fleming.

Shell thin, transparent, sinistral, conical, turreted; spire

elongate, axis imperforate; aperture angulated anteriorly, columella smooth, arcuated.

Syn. Peracle, *Forbes*. Scæa, *Phil.* Spiralis, sp. *Eyd. and Soul.*

Ex. H. bulimoides, *D'Orbigny*, pl. 7, fig. 5. Operculum, H. bulimoides, fig. 5, *a*. Shell, H. clathratus, *Eydoux and Souleyet*, fig. 5, *b*.

These Pteropods, say M. Eydoux and Souleyet, in speaking, in the "Voyage of the Bonite," of their genus *Spirialis*, are distributed through all seas, and we have met with them alike in the Atlantic, the Indian and Pacific oceans, and in the Chinese seas.

Species of Heterofusus.

balea, *Möller.*
bulimoides, *D'Orb.*
clathratus, *Eyd. and Soul.*
Gouldii, *Stimp.*
Mac Andrei, *Forbes and Hanley.*
trochiformis, *D'Orb.*
retroversus, *Flem.*

Genus CHELETROPIS, Forbes.

Shell spiral, turbinate, dextral, imperforate, spirally ridged or double-keeled, and transversely wrinkled; spire prominent, its nucleus sinistral: aperture ovate, canaliculated below, its outer margin furnished with two claw-like lobes, the one central and formed by a prolongation of the margin between the keels of the body-whorl, the other smaller and near the canal; peristome thickened, reflected, forming a conspicuous margin.

Operculum—?

Ex. C. Huxleyi, *Forbes*, pl. 7, fig. 6.

This genus appears to be gregarious, and was taken in a towing-net in the sea off the south-east corner of Australia during the voyage of H.M.S. "Rattlesnake." The

animal is not yet known, but it is supposed, with probability, by Professor Forbes to be Pteropodous. There is but one species known, dedicated to Thomas Huxley, F.R.S., the philosophic Zootomist attached to the "Rattlesnake."

Order GYMNOSOMATA.

Body naked, without any shell. Head distinct. Wings two, or four, at the junction between the head and the body, with a central intermediate lobe or rudimentary foot. Gills exterior.

In this order there are three families, all without shelly covering. The warmer seas doubtless abound in numerous undiscovered forms; those already known have a single heart, the sexes are united, and the respiratory organs are external.

Fam. CLIONIDÆ.

Animal fusiform. Head with a series of conical prominences on each side. Wings two, with a central foot-like appendage between them.

In this family the conical prominences probably represent tentacular arms in a rudimentary condition; there are two genera, one, *Clione*, with the head indistinct and the tentacles defined, and the other, *Cliodita*, with the head distinct, and the tentacles not apparent.

Genus CLIONE, Pallas.

Head indistinct; tentacles six, conical, three on each side. Tooth of lingual membrane broad, convex behind, slightly two-lobed and denticulated in front; lateral teeth, 12-12, simple, arched, rather swollen at the base, the outer gradually diminishing in size.

Syn. Clio, *O. Fabr.* ? Amphirea, *Rafin.* ? Dicroptera, *Rafin.*

Ex. C. borealis, *Bruguière*, pl. 7, fig. 7.

The *C. borealis* is very common in the Northern seas, and is the food of the whale; it has been anatomically described by the Baron Cuvier. Scoresby observes that in swimming it brings the tops of its fins almost in contact, first on one side and then on the other.

Species of Clione.

australis, *Brug.* borealis, *Brug.*

Genus CLIODITA, Quoy and Gaimard.

Body fusiform; head small, hooded, or bilobed, separated from the trunk by a contraction; tentacles not apparent.

Ex. C. fusiformis, *Quoy and Gaimard*, pl. 7, fig. 8.

There are three species of this imperfectly known genus figured in the "Voyage of the Astrolabe," *viz. C. caduceus* and *C. fusiformis* from the Cape of Good Hope, and *C. pyramidalis* from off Amboina.

Species of Cliodita.

caduceus, *Quoy and Gaim.* pyramidalis, *Quoy and Gaim.*
fusiformis, *Quoy and Gaim.*

Fam. PNEUMODERMONIDÆ.

Body fusiform. Head with arms furnished with pedicellate suckers. Wings two, entire, with a central foot-like appendage placed at the base of the head. Gills on the hinder part of the body.

In this family the genera are distinguished principally by the gills, which in *Pneumodermon* are lobed, and at the hinder part of the body; in *Spongiobranchia* they form a prominent ring near the end of the body; in *Trichocyclus* a ciliated ring round the middle of the body; and in *Pelagia* they are indistinct or wanting.

Genus PNEUMODERMON, Cuvier.

Body oblong, elongated or subglobose; fins small and rounded, on each side of the head. Gills in the form of a four-lobed leaf, at the extremity of the body.

Syn. Pneumoderma, *Péron* and *Lesueur*. Ægle, *Oken*.

Ex. P. violaceum, *D'Orbigny*, pl. 7, fig. 9.

The *Pneumodermon*, like other genera of this class of animals, is by no means shy in its habits, and swims actively about in the vessel of water in which it is confined, but when touched folds its fins upon its body and falls to the bottom, rolled up into a little ball: there are four species described.

Species of Pneumodermon.

pellucidum, *Quoy and Gaim.* rubrum, *Quoy and Gaim.*
Peronii, *Lam.* violaceum, *D'Orb.*

Genus SPONGIOBRANCHIA, D'Orbigny.

Body fusiform; head distinct; mouth with long appendages sometimes furnished with sessile suckers. Wings two, entire, with a foot-like appendage. Gills in a prominent spongy ring on the end of the body.

Ex. S. australis, *D'Orbigny*, pl. 7, fig. 10.

This genus is remarkable for the near approximation it makes to the Cephalopods, the cephalic arms or appen-

dages of the mouth being furnished with rudimentary *acetabula*, or suckers, like those of the Cuttle-fishes.

Species of Spongiobranchia.

australis, *D'Orb.* elongata, *D'Orb.*

Genus TRICHOCYCLUS, Eschscholtz.

Body elongate. Head produced, conical, with two lateral tentacles. Fins two, oblong, lateral, with a lanceolate intermediate lobe. Gills in a ciliated ring round the middle of the abdomen, and with a similar ring round the base of the head and on the hinder end of the body.

Ex. T. Dumerilii, *Eschscholtz*, pl. 7, fig. 11.

There is but a single species of this curious genus, which we believe has not, however, been met with since it was first described and figured by its discoverer in the "Isis" of Oken.

Genus PELAGIA, Quoy and Gaimard.

Animal gelatinous, rough, transparent. Body oval, elongate, contracted in the middle; head indistinct, with two small tubercles; mouth hidden. Fins two, lateral, at the contraction of the body; vent at the base of the right fin; nerves very apparent.

Ex., P. alba, *Quoy and Gaimard*, pl. 7, fig. 12.

Pelagia, as its name implies, inhabits the high seas; there is but one species known, which is white-netted and rough, with submedial rounded striated fins.

Fam. CYMODOCEIDÆ.

Body divided into two parts. Wings four, two on each

The two upper wings in this family are broad and rounded, while the lower ones are nearly linear; the neck appears to be elongated, and the mouth is furnished with four lobes.

Genus CYMODOCEA, D'Orbigny.

Animal as in family.

Ex. C. diaphana, *D'Orbigny*, pl. 7, fig. 13.

Of this curious genus only a single species, which inhabits the Atlantic Ocean, has been observed; the body is translucent, showing the violet viscera; the medial appendage is elongate and truncated, the upper pair of broad ovate fins has the lower edges thickened, and the lower pair is narrow and digitated.

Class GASTEROPODA:

Head distinct, furnished with eyes and tentacles. Body usually protected by a conical or spiral shell. Lower part of body formed into a thickened, expanded, creeping disk or foot.

The Gasteropods, so termed from the circumstance of their crawling on their belly, may be known from the other Molluscous classes by the head being always present and provided with eyes and tentacles, the former being either sessile, or on the ends of ommatophora or peduncles, which are either free or connate. They constitute by far the most numerous section of Mollusks, and comprise not only all those that live upon the land, but likewise a very large proportion of those that breathe by gills and inhabit the water.

With the exception of the air-breathing families, the Gasteropods are differently shaped when very young, the fry having ciliated wings on the sides of the head by which they swim freely about, and the body contained in a little clear spiral shell with the aperture closed by an operculum. As they grow, however, the head-wings are absorbed, the foot or creeping disk becomes developed, and the shells assume the forms peculiar to the different genera. In the Nudibranchs the shell falls off and disappears when the locomotive foot appears, but sometimes it remains rudimental within the folds of the mantle. In their adult

condition they are either predatory and carnivorous, or prefer a vegetable diet, and inhabit, sometimes the high seas, as the Nucleobranchs; sometimes the forest trees and surface of the earth, as the Pulmonifera; sometimes the lakes and rivers, as the *Ampullariidæ*, and sometimes the shallow creeks and bays, as the zoophagous tribes generally. In the Prosobranchiate division the adult animal is provided with a shelly covering, usually more or less spiral, with the aperture either entire, or notched, or produced into a canal in front; in the Opisthobranchiate division the body is either naked, or with the gills protected by a shelly valve, which is external, or concealed in the mantle. In the Nucleobranchs or the Heteropoda of Lamarck, the foot is modified for swimming, as the animals are pelagic, and the shell is often very thin, rudimentary, or wanting. The animals of the Pulmoniferous division are usually encased in spiral shells, which, in some tribes, however, are rudimentary, and in others altogether wanting.

In the branchiferous Gasteropods the form and position of the gills vary very considerably and offer excellent characters for defining the orders; in the Nucleobranchs they form a projecting comb-like tuft; in the Nudibranchs they are exposed upon the surface of the back; in the Tectibranchs they constitute a plume between the mantle and the foot; in the Prosobranchs, which include most of the Pectinibranchs of Cuvier, the gills, usually unsymmetrical, are in the form of two comb-like organs in a cavity over the back protected by the mantle; while in the Pulmoniferous tribes the place of the gills is occupied by an air-sac lined with a vascular net-work, which acts like a lung. The modifications which the foot, the mantle, and the other organs undergo, will be mentioned under the various groups which these peculiarities create.

The shells of the Gasteropods, those elegant calcareous cones moulded on the body of the animal, and justly prized for their varied markings, exquisite sculpture, and graceful contour of form, most frequently assume the shape of a spiral coil. The spire is sometimes on the same plane, as in the discoidal *Coretus;* or produced, as in the turreted *Megaspira;* or loosely coiled, as in the irregular *Vermetus;* or unrolled and partly straight, as in the singular *Campulotus;* or it may be involute, as in the polished Cowry; or tapering at each end, as in the spindle-shaped *Fusus;* or with the last turn very large, as in the ear-shaped *Haliotis;* or the coil may have a flattened base, as in the top-shaped *Trochus.* When the shelly cone is not spirally coiled, it is often tubular, as in the tooth-shaped *Dentalium;* or flattened out, as in the shield-shaped *Scutus;* simply conical, as in the Limpet; or slipper-shaped, as in *Crypta* and *Catillus.* The coils are generally right-handed, but sometimes they are sinistral, as in *Clausilia.* The marine spiral Gasteropods, which breathe by gills, usually have the mouth of the shell closed when at rest by a horny, or calcareous operculum; the air-breathing families are either provided with a similar means of defence, or are entirely destitute of this appendage.

Sub-class PROSOBRANCHIATA.

Gills pectinate or plumose, placed in a mantle-cavity above the neck, or under the mantle on the left side. Heart situated behind the gills. Sexes distinct. Abdomen well developed, usually spiral, and protected by a shell. Adult and larva shell-bearing; larva furnished with deciduous ciliated fins springing from the sides of the head.

The Prosobranchiate Gasteropods comprise the Cuvierian

orders of Pectinibranchiata, Scutibranchiata, Cyclobranchiata, and Tubulibranchiata, the two latter appearing, however, to be modifications of the second.

Order PECTINIBRANCHIATA.

Gills comb-like, formed of one, or rarely of two, longitudinal series of laminæ on the left side of the mantle over the back of the neck. Animal unisexual. Shell spiral.

The Pectinibranchiate Gasteropods offer to our contemplation a vast assemblage of Mollusks remarkable for the extreme variety in the form of their shelly envelopes, but well associated by Cuvier on account of the comb-like nature of their gills. They have been divided by Lamarck into Zoophagous and Phytophagous, the former being supposed always to possess a siphon and emargination in the mouth of the shell, and the latter being without either. This arrangement, however, does not hold good, and they are here divided into two sections from the form of the mouth.

Sub-order PROBOSCIDIFERA.

Head small, with an elongated, retractile, longly exsertile proboscis, when retracted hidden within the body; tentacles close together at the base, or united by a veil over the base of the proboscis; eyes sessile, on the outer base of the tentacles. Operculum annular (except in *Natica*). Carnivorous, eating living mollusca and other animals.

The predaceous tribes of Prosobranchiate Gasteropods are said to form the round holes so commonly found in other shells; the lingual membrane is placed near the apex of the exserted trunk; the trunk or proboscis is of a very compli-

cated structure, and is furnished with a number of muscles well described by Cuvier in his anatomy of *Buccinum*, which enable it to be withdrawn into itself like the tentacles of a snail. The above description of this extensive and important group of molluscous animals forms a portion of new and valuable researches for which we are indebted to Dr. Gray, who has contributed so materially, by his numerous writings, to rescue this class of beings from the confusion into which they have been thrown by the exclusive attention formerly directed to their shells only.

Fam. MURICIDÆ.

Teeth on lingual membrane in three series (1·1·1), the central broad, the lateral versatile; lateral teeth flat, with a bent up process at the end, more or less at right angles with the base. Mantle enclosed, the margin producing varices at intervals across the shell, and extended in front forming a straight more or less elongated siphon. Foot simple in front.

Shell spiral, often turreted, more or less extended at the fore-part into a straight siphonal canal.

In this family are comprised many of the largest and most beautiful shells hitherto discovered, often remarkable for the delicacy of their sculpture and the variety of their colours.

Sub-fam. MURICINÆ.

Operculum ovate, nucleus sub-apical, within the apex.

Shell with the spire usually as long as the aperture, the surface rough, or with the varices well-developed.

Genus MUREX, Linnæus.

Shell ovate or oblong; spire prominent, acute, whorls con-

vex, ornamented with three or more continuous varices, which are foliaceous, tubercular, or spinose; aperture round or ovate, ending in front in a contracted canal, long, straight and tubular, or short and recurved, often partly closed.

Syn. Purpura, *Humph.* Aranea, *Perry.*

Ex. M. foliatus, *Gmelin*, pl. 8, fig. 1. Operculum, M. regius, *Wood*, fig. 1, *a*, 1, *b*. Shell, M. tribulus, *Linnæus*, fig. 1, *c*.

A remarkable peculiarity in this genus is the circumstance of the mantle-margin secreting varices on the completion of about a third of a whorl annually. In their geographical distribution tropical America appears to harbour the greatest number; they are, however, abundant also in the Eastern Seas, the West Indies, and Africa. The smaller cancellated species are usually from deep water, as are those with wing-like varices (*Pteronotus*, Swains.); the more highly-coloured species with frondose varices and branching spines abound in rocky places near the coasts, and the purpuriform species (*Vitularia*, Swains.) are principally from coral reefs, under stones, and from crevices of rocks; the long-beaked spiny forms are usually dredged from tolerably deep water.

Species of Murex.

aduncospinosus, *Beck.*
brevispina, *Lam.*
concinnus, *Reeve.*
duplicatus, *Chem.*
funiculatus, *Reeve.*
hystrix, *Mart.*
messorius, *Sow.*
Mindanensis, *Sow.*
motacilla, *Chem.*
nigrescens, *Sow.*
nigrispinosus, *Reeve.*
nodatus, *Reeve.*
occa, *Sow.*
plicatus, *Sow.*
pliciferus, *Sow.*
pulcher, *A. Adams.*
rarispina, *Lam.*
rectirostris, *Sow.*
recurvirostris, *Brod.*
similis, *Sow.*

ternispina, *Lam.*
trapa, *Bolt.*
tribulus, *Linn.*
trigonulus, *Lam.*
tumulosus, *Sow.*

Sub-gen. HAUSTELLUM, Klein (Brontes, *Montf.* Haustellaria, *Swains.*).

Shell without spines; varices tuberculated; canal excessively long.

chrysostoma, *Gray.*
elegans, *Beck.*
haustellum, *Linn.*
trilineatus, *Reeve.*
variegatus, *Mart.*

Sub-gen. RHINOCANTHA, H. and A. Adams.

Spire short; varices numerous and strongly spined; canal long and recurved.

brandaris, *Linn.*
cornutus, *Linn.*

Sub-gen. CHICOREUS, Montfort.

Spire elevated; varices few, foliated; canal moderate.

aculeatus, *Lam.*
adustus, *Lam.*
affinis, *Reeve.*
argyna, *Meusch.*
axicornis, *Lam.*
Banksii, *Sow.*
brevifrons, *Lam.*
calcar, *Kien.*
capucinus, *Chem.*
cervicornis, *Lam.*
corrugatus, *Sow.*
cornu-cervi, *Mart.*
crassivaricosus, *Reeve.*
crocatus, *Reeve.*
elongatus, *Lam.*
fenestratus, *Chem.*
florifer, *Reeve.*
frondosus, *Mart.*
Gubbi, *Reeve.*
laciniatus, *Sow.*
lignarius, *A. Adams.*
maurus, *Brod.*
megacerus, *Sow.*
microphyllus, *Lam.*
palmiferus, *Sow.*
pudoricolor, *Reeve.*
purpuratus, *Reeve.*
ramosus, *Linn.*

rufus, *Lam.*
Sauliæ, *Sow.*
Senegalensis, *Gmel.*
Sinensis, *Reeve.*
spectrum, *Reeve.*
Steeriæ, *Reeve.*
strigatus, *Reeve.*
territus, *Reeve.*
torrefactus, *Sow.*
tubulatus, *Mart.*
virgineus, *Bolt.*

Sub-gen. PTERONOTUS, Swainson.

Varices three, compressed, fin-shaped; canal moderate, generally closed by the union of the two lips at their base.

acanthopterus, *Lam.*
alabaster, *Reeve.*
alatus, *Bolt.*
bipinnatus, *Reeve.*
Burnettii, *Adams and Reeve.*
cancellatus, *Sow.*
centrifugus, *Hinds.*
clavus, *Kien.*
crassus, *A. Adams.*
Cumingii, *A. Adams.*
emarginatus, *Sow.*
eurypteron, *Reeve.*
falcatus, *Sow.*
festivus, *Hinds.*
foliatus, *Gmel.*
Gambiensis, *Reeve.*
hamatus, *Hinds.*
hemitripterus, *Lam.*
lingua-vervecina, *Chem.*
macropteron, *Desh.*
mitriformis, *Sow.*
monoceros, *Sow.*
osseus, *Reeve.*
pellucidus, *Reeve.*
phyllopterus, *Lam.*
pinniger, *Brod.*
plorator, *Adams and Reeve.*
roriflus, *Adams and Reeve.*
rubridentatus, *Reeve.*
tricarinatus, *Lam.*
triformis, *Reeve.*
tripterus, *Born.*
triqueter, *Born.*
uncinarius, *Lam.*
unicornis, *Reeve.*

Sub-gen. PHYLLONOTUS, Swainson (Muricanthus, Swains. Centronotus, Swains. Cerastoma, *Conrad*).

Spire short; varices numerous, foliated; canal moderate; outer lip often with a tooth near the base.

ambiguus, *Reeve.*
angularis, *Lam.*

bicolor, *Valenc.*
bifasciatus, *A. Adams.*
brassica, *Lam.*
crispus, *Brod.*
duplex, *Mart.*
endivia, *Lam.*
imperialis, *Swain.*
lyratus, *A. Adams.*
melanoleucus, *Mörch.*
melanomathos, *Gmel.*
monodon, *Sow.*
nigritus, *Meusch.*
nitidus, *Brod.*
oculatus, *Reeve.*
oxyacantha, *Brod.*
pomiformis, *Mart.*
princeps, *Brod.*
radix, *Gmel.*
regius, *Wood.*
rosarium, *Chem.*
saxatilis, *Linn.*
spinicostatus, *Valenc.*
spinosus, *A. Adams.*
Stainforthii, *Reeve.*
trunculus, *Linn.*
turbinatus, *Lam.*
varius, *Sow.*
Yoldii, *Mörch.*
Zealandicus, *Quoy.*

Sub-gen. VITULARIA, Swainson.

Varices simple, nearly obsolete; inner lip flattened.

foveolatus, *Hinds.*
salebrosus, *King.*
scaber, *King.*

Sub-gen. HOMALOCANTHA, Mörch.

Spire with the whorls rounded and sutures deep; varices foliated; canal long.

digitatus, *Sow.*
rota, *Sow.*
scorpio, *Linn.*
secundus, *Lam.*
varicosus, *Sow.*

Sub-gen. OCINEBRA, Leach (Tritonalia, *Flem.*).

Spire elevated; varices numerous, rounded, sometimes raised; canal generally closed.

alveatus, *Kiener.*
badius, *Reeve.*
bæticus, *Reeve.*
breviculus, *A. Adams.*

buxeus, *Brod.*
Californicus, *Hinds.*
caliginosus, *Reeve.*
corallinus, *Sacchi.*
cyclostomus, *Sow.*
decussatus, *Reeve.*
densus, *H. and A. Adams* (inornatus, *A. Adams*).
Edwardsii, *Menke.*
erinaceus, *Linn.*
erosus, *Brod.*
exasperatus, *A. Adams.*
excavatus, *A. Adams.*
fasciatus, *Sow.*
fimbriatus, *Hinds.*
fusiformis, *A. Adams.*
gyratus, *Hinds.*
horridus, *Brod.*
incisus, *Brod.*
inconspicuus, *Sow.*
inornatus, *Recluz.*
Kieneri, *Reeve.*
laminiferus, *Reeve.*
laqueatus, *Sow.*
luculentus, *Reeve.*
lugubris, *Brod.*
maculatus, *Reeve.*
margariticola, *Brod.*
niveus, *A. Adams.*
nuceus, *Mörch.*
nux, *Reeve.*
obeliscus, *A. Adams.*
pistacia, *Reeve.*
planiratus, *Reeve.*
polygonulus, *Lam.*
purpuroides, *Dunker.*
serotinus, *A. Adams.*
Singaporensis, *A. Adams.*
squamulosus, *Phil.*
tetragonus, *Brod.*
torosus, *Lam.*
vibex, *Brod.*

Sub-gen. MURICIDEA, Swainson.

Spire produced, as long, or longer than the body whorl; varices numerous; no internal channel at the top of the aperture.

balteatus, *Beck.*
Blainvillii, *Payr.*
carduus, *Reeve.*
cariniferus, *Sow.*
cirrosus, *Hinds.*
clathratus, *Reeve.*
cristatus, *Brod.*
dispacus, *Brod.*
distinctus, *Christ.*
dubius, *Sow.*
exiguus, *Brod.*
euracanthus, *A. Adams.*
gravidus, *Hinds.*
hexagonus, *Lam.*
humilis, *Brod.*
iostomus, *A. Adams.*
lappa, *Brod.*
lepidus, *Reeve.*
mundus, *Reeve.*
muricatus, *Hinds.*
noduliferus, *Sow.*
Norrisii, *Reeve.*
nucula, *Reeve.*
octogonus, *Quoy.*

pagodus, *A. Adams.*
peritus, *Hinds.*
pleurotomoides, *Reeve.*
pudicus, *Reeve.*
radicatus, *Hinds.*
rubescens, *Brod.*
rusticus, *Reeve.*
vittatus, *Brod.*

Genus TYPHIS, Montfort.

Mantle-margin prolonged into the last tubular spine between the varices.

Shell ovate or oblong, muriciform, with projecting hollow tubes between the spinose varices, the last open, occupied by the excurrent canal; aperture orbicular, prolonged in front into a closed siphonal canal.

Ex. T. Sowerbyi, *Broderip*, pl. 8, fig. 2. Operculum, T. Sowerbyi, fig. 2, *a*, 2, *b*. Shell, T. Sowerbyi, fig. 2, *c*.

The recent species of this genus have been found in the Mediterranean, West Columbia, Western Africa, and at the Cape; a small species likewise is from the Indian Archipelago. There are eight fossil species known, from the Eocine formations of London and Paris.

Species of Typhis.

arcuatus, *Hinds.*
Belcheri, *Hinds.*
Clerii, *Petit.*
coronatus, *Brod.*
Cumingii, *Brod. and Sow.*
nitens, *Hinds.*
pinnatus, *Hinds.*
quadratus, *Hinds.*
Sowerbyi, *Brod.*

Genus TROPHON, Montfort.

Shell fusiform, varices numerous, lamelliform, or laciniated; spire prominent; aperture ovate; canal open, usually turning to the left; columella smooth, arcuated.

Syn. Muricidea (part), *Swains.*

Ex. T. Patagonicus, *D'Orbigny*, pl. 8, fig. 3. Operculum, T. laciniatus, *Martini*, fig. 3, *a*, 3, *b*. Shell, T. Geversianus, *Pallas*, fig. 3, *c*.

The species of this genus are natives of cold climates, belonging for the most part to the arctic and boreal seas; they are inhabitants of deep water, and, besides their laciniated or lamellar varices, may be known by their peculiar texture and the dark colour of the interior of their apertures.

Species of Trophon.

Bamffius, *Penn.*
Barvicensis, *Johnst.*
borealis, *Reeve.*
Branscombii, *Clk.*
buccineus, *Brug.*
candelabrum, *Adams and Reeve.*
cinereus, *Say.*
clathratus, *Linn.*
corrugatus, *Reeve.*
crassilabrum, *Gray.*
cretaceus, *Reeve.*
craticulatus, *Fabr.*
crispus, *Couth.*
decolor, *Phil.*
duodecimus, *Gray.*
fructicosus, *Gould.*
Geversianus, *Pallas.*
Gunneri, *Lovén.*
incisus, *Gould.*
inermis, *Sow.*
labiosus, *Gray.*
laciniatus, *Mart.*
liratus, *Couth.*
Mexicanus, *Reeve.*
minutisquamosus, *Reeve.*
multicostatus, *Eschsch.*
muricatus, *Mont.*
muriciformis, *King and Brod.*
Orpheus, *Gould.*
pallidus, *Sow.*
Patagonicus, *D'Orb.*
Peruvianus, *Brug.*
plumbeus, *Phil.*
scalariformis, *Gould.*
senticosus, *Lam.*
Stangeri, *Gray.*
vaginatus, *Phil.*

Sub-fam. FUSINÆ.

Operculum ovate, acute, nucleus apical. Shell more or less spindle-shaped, varices rudimentary or wanting.

Genus FUSUS, Klein.

Shell fusiform; spire many-whorled, acuminate, longer than the last whorl; aperture oval; canal long, straight; columella smooth, arcuated; outer lip entire.

Syn. Colus, *Humph.* Fusinus, *Rafin.* Syrinx, *Bolten.*

Ex. F. colus, *Linnæus*, pl. 8. fig. 4. Operculum, F. Dupetit-Thouarsii, *Kiener*, fig. 4, *a*, 4, *b*. Shell, F. incisus, *Martini*, fig. 4, *c*.

The true spindle-shells, as they are sometimes termed, chiefly inhabit the Eastern Seas, China, and Australia; a few of them are always reversed; when they crawl they readily elevate the shell, and are tolerably lively; some of them are highly coloured, and have very elegantly formed shells.

Species of Fusus.

acus, *Adams and Reeve.*
aureus, *Reeve.*
australis, *Quoy.*
Beckii, *Reeve.*
bellus, *C. B. Adams.*
Blosvillei, *Reeve.*
cælatus, *Reeve.*
cinnamomeus, *Reeve.*
clausicaudatus, *Hinds.*
closter, *Phil.*
colus, *Linn.*
crebriliratus, *Reeve.*
Cumingii, *Jonas.*
distans, *Lam.*
Dupetit-Thouarsii, *Kien.*
ficula, *Reeve.*
forceps, *Perry.*
fragrans, *Reeve.*
glabratus, *Chem.*
glomeratus, *Meusch.*
gracillimus, *Adams and Reeve.*
gradatus, *Reeve.*
heptagonalis, *Reeve.*
incisus, *Mart.*
Japonicus, *Gray.*
lanceola, *Mart.*
laticostatus, *Desh.*
lignarius, *Reeve.*
longicauda, *Bory.*
longissimus, *Lam.*
marmoratus, *Phil.*
Mexicanus, *Reeve.*
multicarinatus, *Lam.*
myristicus, *Reeve.*

Nicobaricus, *Chem.*
nobilis, *Reeve.*
Novæ Hollandiæ, *Reeve.*
oblitus, *Reeve.*
pagodus, *Less.*
parvulus, *Chem.*
pastinàca, *Reeve.*
polygonoides, *Lam.*
pulchellus, *Phil.*
pyrulatus, *Reeve.*
reuma, *Mart.*
rostratus, *Oliv.*
rufus, *Reeve.*
spectrum, *Adams and Reeve.*
strigatus, *Phil.*
Syracusanus, *Linn.*
Taylorianus, *Reeve.*
toreuma, *Lam.*
torulosus, *Lam.*
tuberculatus, *Lam.*
turbinelloides, *Reeve.*
ustulatus, *Reeve.*
vaginatus, *Desh.*
vittatus, *Quoy.*
ventricosus, *Beck.*
vulpinus, *Quoy and Gaim.*

Sub-gen. EVARNE, H. and A. Adams.

Shell oblong-ovate; canal very short, a little recurved; whorls convex, smooth.

linea, *Mart.*

Sub-gen. SINISTRALIA, H. and A. Adams.

Shell fusiform, reversed; canal long; whorls rounded.

elegans, *Reeve.*
maroccanus, *Chem.*
scævulum, *Meusch.*

Genus NEPTUNEA, Bolten.

Shell fusiform, ventricose; spire elevated, whorls rounded, covered with a horny epidermis, apex papillary; aperture oval; canal short; inner lip simple, smooth.

Syn. Chrysodomus, *Swains.*

Ex. N. antiqua, *Linnæus*, pl. 8. fig. 5. Operculum, N. antiqua, fig. 5, *a*. 5, *b*. Shell, N. antiqua, fig. 5, *c*.

The *Neptuneæ* resemble ventricose *Fusi*, with very short canals; they are usually of an uniform colour, and are invested with an epidermis. They are principally from the northern and European parts of the globe, being most numerous in the Northern Seas. One species, *N. antiqua*, is sold in the London markets under the name of "Whelk."

Species of Neptunea.

alternata, *Phil.*
anceps, *H. and A. Adams* (Pyr. anomala, *Reeve*).
anomala (Bucc.), *Reeve.*
antiqua, *Lam.*
arctica, *Phil.*
argyrostoma, *Lam.*
Baerii, *Midd.*
Behringii, *Midd.*
borealis, *Phil.*
buxea, *Reeve.*
cassidariæformis, *Reeve.*
contraria, *Lam.*
craticulata, *Blainv.*
decemcostata, *Say.*
deformis, *Reeve.*
despecta, *Linn.*
dilatata, *Quoy and Gaim.*
fenestrata, *Turton.*
Fontanei, *D'Orb.*
fornicata, *Gmel.*
funiculata, *Reeve.*
fusiformis, *Blainv.*
fusoides, *Reeve.*
glacialis, *Gray.*
heros, *Gray.*
Largillierti, *Petit.*
lineata, *Kien.*
lurida, *Midd.*
lyrata, *Mart.*
modificata, *Reeve.*
multangula, *Phil.*
nodosa, *Mart.*
Norvegica, *Chem.*
Ochotensis, *Midd.*
oodes, *Midd.*
pallida, *Brod. and Sow.*
polaris, *Gray.*
Reeviana, *Petit.*
Sabinii, *Gray.*
Schantarica, *Midd.*
signa, *Reeve.*
simplex, *Midd.*
Sitchensis, *Midd.*
soluta, *Gould.*
spadicea, *Reeve.*
sulcata, *Lam.*
tessalata, *Schub. and Wag.*
tornata, *Gould.*
trochulus, *Reeve.*
tuberosa, *Reeve.*
Turtoni, *Bean.*
varicosa, *Chem.*
Zealandica, *Quoy and Gaim.*

Sub-gen. SIPHO, Klein (Atractus, *Agassiz.* Fusus, *Lam.* Tritonofusus, *Beck*).

Shell thin; canal produced and recurved.

Islandica, *Chem.*
latericia, *Gould.*
pulla, *Reeve.*
pygmæa, *Gould.*
ventricosa, *Gray.*

Genus CASSIDULUS, Humphrey.

Operculum solid, claw-like, nucleus apical.

Shell pyriform, solid; spire short, nodulose, spiny; aperture oval, oblong; canal short, open; columella smooth; outer lip simple.

Syn. Galeodes, *Bolten.* Melongena, *Schum.* Mancinella, *Mus. Berl.*

Ex. C. asper, *Martini*, pl. 9, fig. 1. Operculum, C. asper, fig. 1, *a*, 1, *b*. Shell, C. melongena, *Linnæus*, fig. 1, *c*.

In this genus the head of the animal is greatly elongated, with the tentacles at the end; there is, however, no rostrum, but a retractile proboscis; the tentacles are small, and the eyes are sessile at their outer bases. The *Cassiduli* are found chiefly in the Eastern Seas; a few, however, are from Mexico, the West Indies, and California.

Species of Cassidulus.

melongena, *Linn.*
patulus, *Brod. and Sow.*

Sub-gen. VOLEMA, Bolten (Pugilina, *Schum.*).

Shell umbilicated; spire nodulous; aperture narrow.

Paradisiacus, *Reeve.* pugilinus, *Born.*

Sub-gen. MYRISTICA, Swainson.

Shell subpyriform; spire strong, spiny, or tuberculated; aperture with an internal and ascending canal; basal channel wide.

asper, *Mart.* bucephalus, *Lam.*
bispinosus, *Phil.* calcaratus, *Dillw.*

Genus HEMIFUSUS, Swainson.

Operculum—?

Shell unequally fusiform; spire shorter than the aperture, ponderous, whorls armed with compressed spines; aperture oblong ovate, with an internal ascending canal at the hind part, produced anteriorly; columella smooth; outer lip simple.

Syn. Cochlidium, *Gray.*

Ex. H. tuba, *Gmelin*, pl. 9, fig. 2. Shell, H. tuba, fig. 2, *a.*

The animal in this genus has the same elongated head and small tentacles with the eyes at their base as *Cassidulus*, but in M. Eydoux's figure no operculum is shown, which in *Cassidulus* is very large and conspicuous.

Species of Hemifusus.

Belcheri, *Hinds.*
cochlidium, *Linn.*
colosseus, *Lam.*
corona, *Gmel.*
elongatus, *Lam.*
lacteus, *Reeve.*
morio, *Linn.*
Ternatinus, *Gmel.*
tuba, *Gmel.*

Genus PISANIA, Bivona.

Shell oblong; spire prominent, whorls smooth, or spirally striated; canal very short; outer lip thickened and crenated.

Syn. Pusio, *Gray.*

Ex. P. fasciolata, *Reeve*, pl. 9, fig. 3. Operculum, P. striata, *Gmelin*, fig. 3, *a*, 3, *b*. Shell, P. striata, fig. 3, *c*.

The *Pisaniæ*, with but few exceptions, are small shells, and have been hitherto distributed in various genera, but possess sufficient character in common, to form a distinct group.

Species of Pisania.

buccinulum, *Mart.*
cingilla, *Reeve.*
discolor, *Quoy and Gaim.*
fasciculata, *Reeve.*
flammulata, *Quoy and Gaim.*
pedicularis, *Lam.*
pennata, *Chem.*
pusio, *Linn.*
striata, *Gmel.*
trilineata, *Reeve.*
tritonoides, *Reeve.*

Genus METULA, H. and A. Adams.

Shell elongately fusiform, finely canellated; spire elevated, acute; aperture narrow; inner lip distinct, smooth; outer lip thickened externally, crenulated within, emarginate posteriorly.

Syn. Buccinum sp., *Hinds.*

Ex. M. clathrata, *Adams and Reeve*, pl. 9, fig. 4.

The *Metulæ* are deep water-shells, mitriform, elegant, and finely cancellated, the columella simple, and the outer lip slightly sinuated posteriorly. There are at present about four species referred to this genus.

Species of Metula.

clathrata, *Adams and Reeve.*
Cumingii, *A. Adams.*
Hindsii, *H. and A. Adams.*
mitrella, *Adams and Reeve.*

Genus CANTHARUS, Bolten.

Shell bucciniform, more or less ventricose in the middle, narrowed anteriorly; spire and aperture nearly equal; columella generally with a few obtuse and transverse ridges; outer lip internally crenated, and with a superior siphon; inner lip thin or wanting.

Syn. Pollia, *Gray.* Polliana, *Mrs. Gray.*

Ex. C. undosus, *Linnæus*, pl. 9, fig. 5. Operculum, C. insignis, *Reeve*, fig. 5, *a*, 5, *b*. Shell, C. undosus, fig. 5, *c*.

The *Canthari* have been designated *Tritons* without varices, and have been usually mixed up with *Murex*, *Purpura* and *Buccinum*. These shells are generally covered in

the recently taken state with a thick coarse brown epidermis, and they are more or less longitudinally plicate.

Species of Cantharus.

erythrostoma, *Reeve.*
melanostoma, *Sow.*
pagodus, *Reeve.*
spiralis, *Gray.*
Tranquebaricus, *Mart.*

Sub-gen. TRITONIDEA, Swainson (Lagena, *Bolt.*).

Shell turreted; canal lengthened.

assimilis, *Reeve.*
auritulus, *Link.*
balteatus, *Reeve.*
biliratus, *Reeve.*
cancellaroides, *Reeve.*
cinis, *Reeve.*
concentricus, *Reeve.*
contractus, *Reeve.*
D'Orbignyi, *Payr.*
farinosus, *Gould.*
gemmatus, *Reeve.*
gracilis, *Reeve.*
heptagonalis, *Reeve.*
incisus, *Gould.*
insignis, *Reeve.*
lautus, *Reeve.*
ligneus, *Reeve.*
liratus, *Gould.*
lugubris, *C. B. Adams.*
marmoratus, *Reeve.*
nigricostatus, *Reeve.*
obliquicostatus, *Reeve.*
pastinaca, *Reeve.*
Proteus, *Reeve.*
ringens, *Reeve.*
rubiginosus, *Reeve.*
sanguinolentus, *Ducl.*
scalarinus, *Lam.*
solidus, *Reeve.*
undosus, *Linn.*
variegatus, *Gray.*
violaceus, *Quoy and Gaim.*

Genus CLAVELLA, Swainson.

Shell solid, thick, subfusiform; spire acuminate, last whorl ventricose, suddenly contracted in front, thickened and rounded next the suture; aperture narrow; canal long

and straight; columella excavated in the middle; outer lip simple.

Syn. Clavellithes, *Swain.* Cyrtulus, *Hinds.*

Ex. C. distorta, *Linnæus*, pl. 9, fig. 6. Operculum, C. serotina, *Hinds*, fig. 6, *a*, 6, *b*. Shell, C. serotina, fig. 6, *c*.

The genus *Cyrtulus*, founded by Hinds on a remarkable shell from Nukuhiva, is a recent species of Swainson's fossil genus *Clavella*; there are also three other recent species. The type is the *Fusus longævus*, Soland.

Species of Clavella.

avellana, *Reeve.*
distorta, *Linn.*
serotina, *Hinds.*
subrostrata, *Gray.*

Genus EUTHRIA, Gray.

Shell fusiform, smooth; aperture oval, produced anteriorly into a long recurved canal; inner lip simple; outer lip posteriorly sinuated.

Syn. Fusus sp., *Lam.*

Ex. E. lignaria, *Lamarck*, pl. 9, fig. 7. Operculum, E. lignaria, fig. 7, *a*. Shell, E. lignaria, fig. 7, *b*.

This genus, of which but a few species are known, may be regarded as *Pisaniæ* with recurved beaks.

Species of Euthria.

antarctica, *Reeve.*
cingulata, *Reeve.*
cornea, *Linn.*
dira, *Reeve.*
ferrea, *Reeve.*
fuscata, *Brug.*
lactea, *Reeve.*
lineata, *Chem.*
littorinoides, *Reeve.*
obscura, *Reeve.*

Fam. TURRITIDÆ.

Teeth on lingual membrane in two lateral series (1·0·1), elongate, subulate. Mantle with a slit in the hinder part of the right side; siphon straight.

Operculum horny, annular.

Shell turreted, subfusiform; aperture with the fore part channelled, straight, and often much produced; outer lip detached at the hind part from the body whorl, forming a sinus, or with the margin fissured near the last whorl.

Sub-fam. TURRITINÆ.

Operculum ovate, acute, nucleus apical.

Genus TURRIS, Humphrey.

Tentacles wide apart; eyes at their outer bases.

Shell turreted, fusiform; spire elevated; aperture oval; canal long and straight; columella smooth; outer lip notched anteriorly, and with a deep slit near the suture.

Syn. Pleurotomus, *Montf.* Pleurotoma, *Lam.* Pleurotomarius, *Dum.*

Ex. T. Babylonius, *Linnæus*, pl. 10, fig. 1, Operculum, T. Babylonius, fig. 1, *a*, 1 *b*. Shell, T. Babylonius, fig. 1, *c*.

The species of this genus are found in all parts of the world, being, however, most numerous in the countries of Asia; they are met with from low-water mark to one hundred fathoms.

Species of Turris.

abbreviatus, *Reeve.*
albinus, *Lam.*
armillatus, *Reeve.*
Babylonius, *Linn.*
candidus, *Jonas.*
carinatus, *Gray.*
cinguliferus, *Lam.*
crispus, *Lam.*
cryptorraphe, *Sow.*
faginus, *Adams and Reeve.*
fascialis, *Lam.*
Garnonsii, *Reeve.*
grandis, *Gray.*
Lelieuri, *Recluz.*
marmoratus, *Lam.*
nobilis, *Hinds.*
pictus, *Beck.*
spectabilis, *Reeve.*
tigrinus, *Lam.*
undosus, *Lam.*
unedo, *Valenc.*
venustus, *Reeve.*
violaceus, *Hinds.*
virgo, *Lam.*

Sub-gen. SURCULA, H. and A. Adams (Turricula, *Schum.*, not *Klein*).

Shell turreted; inner lip obsolete; canal long, tapering, slightly recurved.

Species of Surcula.

annulatus, *Reeve.*
arcuatus, *Reeve.*
astrictus, *Reeve.*
australis, *Chem.*
brevicaudatus, *Reeve.*
catena, *Reeve.*
cedo-nulli, *Reeve.*
cinctus, *Lam.*
Coreanicus, *Adams and Reeve.*
Deshayesii, *Doumet.*
fulminatus, *Kien.*
funiculatus, *Valenc.*
gemmatus, *Hinds.*
hastula, *Reeve.*
Indicus, *Desh.*
Javanus, *Linn.*
jubatus, *Hinds.*
leucotropis, *Adams and Reeve.*
luridus, *Adams and Reeve.*
nodiferus, *Lam.*
olivaceus, *Sow.*
oxytropis, *Sow.*
pluteatus, *Reeve.*
radula, *Hinds.*
reflexus, *Reeve.*
speciosus, *Reeve.*
tenuis, *Gray.*
tuberculatus, *Gray.*

tuberculiferus, *Brod.* variegatus, *Kien.*
ustulatus, *Reeve.*

Sub-gen. GENOTA, H. and A. Adams (Genot, *Adanson*).

Shell mitriform, whorls finely cancellated; aperture longer than wide; canal not produced; outer lip with a deep posterior sinus.

mitriformis, *Wood.* papalis, *Reeve.*

Sub-gen. BRACHYTOMA, Swainson.

Outer lip ascending and forming a short canal; sinus small and nearly semicircular; inner lip thickened above.

castanea, *Swains.* strombiformis, *Sow.*

Sub-gen. CONOPLEURA, Hinds.

Shell coniform; spire coronated; sinus deep, near the suture.

striata, *Hinds.*

Genus DRILLIA, Gray.

Tentacles approximated; eyes at their outer side near the tip.

Shell turreted; spire raised; aperture oval; canal short, recurved; inner lip thickened; outer lip inflexed, with a deep posterior sinus, and a small sinus at the fore part.

Ex. D. Cagayanensis, *Reeve*, pl. 10, fig. 2. Operculum, D. alabaster, *Reeve*, fig. 2, *a*, 2, *b*. Shell, D. Cagayanensis, fig. 2, *c*.

The principal character by which this genus may be distinguished from *Turris*, is the shortness of the canal, which also is recurved. The *Drilliæ* are very numerous and widely distributed.

Species of Drillia.

alatus, *Chem.*
albicincta, *Adams and Reeve.*
aquatilis, *Reeve.*
Cagayanensis, *Reeve.*
castanea, *Reeve.*
coccinata, *Reeve.*
Coreanica, *Adams and Reeve.*
crocata, *Reeve.*
duplicata, *Sow.*
excentrica, *Sow.*
felina, *Hinds.*
flavidula, *Lam.*
fucata, *Reeve.*
fulva, *Hinds.*
gibbosa, *Chem.*
granulosa, *Sow.*
Griffithii, *Gray.*
impages, *Adams and Reeve.*
impressa, *Hinds.*
inermis, *Hinds.*
interrupta, *Lam.*
lanceolata, *Reeve.*
maculosa, *Sow.*
major, *Gray.*
maura, *Sow.*
militaris, *Hinds.*
Novæ Zealandiæ, *Reeve.*
obeliscus, *Reeve.*
obliquicostata, *Reeve.*
pallida, *Sow.*
pudica, *Hinds.*
putilla, *Reeve.*
pyramidata, *Valenc.*
Quoyi, *De Moul.*
regia, *Beck.*
robusta, *Hinds.*
semicostata, *Kien.*
seminifera, *Gould.*
Sinensis, *Hinds.*
sinistralis, *Petit.*
spectrum, *Reeve.*
spicata, *Hinds.*
Tayloriana, *Reeve.*
umbilicata, *Gray.*
varicosa, *Reeve.*
zonata, *Gray.*

Sub-gen. CRASSISPIRA, Swainson.

Shell subclavate, tuberculated; spire thick; canal nearly obsolete; outer lip thickened internally; inner lip with a thick callus posteriorly.

alabaster, *Reeve.*
albicostata, *Sow.*
albinodata, *Reeve.*
albocincta, *C. B. Adams.*
aterrima, *Sow.*
bætica, *Reeve.*
bicolor, *Sow.*
bijubata, *Reeve.*
biliniata, *Reeve.*
callosa, *Valenc.*

cantharis, *Reeve.* ...
carbonaria, *Reeve.*
clavata, *Sow.*
collaris, *Sow.*
corusca, *Reeve.*
crispata, *Cristof.*
cuprea, *Reeve.*
digitale, *Reeve.*
discors, *Sow.*
Dysoni, *Reeve.*
exarata, *Reeve.*
flavescens, *Reeve.*
fuscescens, *Gray.*
Harfordiana, *Reeve.*
harpularia, *De Moul.*
Hondurasensis, *Reeve.*
incrassata, *Sow.*
Jayana, *C. B. Adams.*
luctuosa, *Hinds.*
nigerrima, *Sow.*
nigrescens, *Gray.*
nitida, *Kien.*
nux, *Reeve.*
Owenii, *Gray.*
palliata, *Reeve.*
papillaris, *Hinds.*
Paria, *Reeve.*
pardalis, *Hinds.*
paxillus, *Reeve.*
pica, *Reeve.*
pulchella, *Reeve.*
pulchra, *Gray.*
quadrifasciata, *Gray.*
regularis, *Reeve.*
rosacea, *Reeve.*
rosea, *Sow.*
rubiginosa, *Hinds.*
rubinicolor, *Reeve.*
rudis, *Sow.*
rugifera, *Sow.*
rustica, *Sow.*
sacra, *Reeve.*
Saulcydianus, *Recluz.*
scarabæus, *Reeve.*
solida, *C. B. Adams.*
splendidula, *Sow.*
tessalata, *Reeve.*
turricula, *Sow.*
unicolor, *Sow.*
unimaculata, *Sow.*
zebra, *Lam.*
zonulata, *Reeve.*

Sub-gen. CLAVUS, Montfort.

Shell clavate, whorls of the spire nodose; aperture effuse at the base.

auriculifera, *Lam.*
Beckii, *Reeve.*
echinata, *Lam.*
exasperata, *Reeve.*
hexagona, *Sow.*
læta, *Hinds.*
unizonalis, *Lam.*
vidua, *Reeve.*
vittata, *Reeve.*

Genus BELA, Leach.

Shell ovate, fusiform; surface dull, smooth, or longitudinally ribbed; spire elevated, shorter than the body whorl; columella flattened; canal short; outer lip with a small sinus at its junction with the body-whorl.

Syn. Mangilia, *Lovén.* Defrancia, *Möller.* Ishnula, *Clark.*

Ex. B. turricula, *Montagu*, pl. 10, fig. 3. Operculum, B. nobilis, *Möller*, fig. 3, *a*, 3, *b*. Shell, B. turricula, fig. 3, *c*.

This genus may be known by the flattened columella. They are chiefly northern shells, and, like *Trophon* and *Admete*, have a peculiar texture common to the shells of low latitudes.

Species of Bela.

Beckii, *Möll.*
brachystoma, *Pfeiff.*
cinerea, *Möll.*
cylindracea, *Möll.*
decussata, *Couth.*
exarata, *Möll.*
fidicula, *Gould.*
harpularia, *Couth.*
Holbolii, *Beck.*
livida, *Möll.*
Mölleri, *Reeve.*
nobilis, *Möll.*
obliquata, *Reeve.*
Pinguelii, *Beck.*
pleurotomaria, *Couth.*
plicata, *C. B. Adams.*
pulla, *Reeve.*
rufa, *Mont.*
rugulata, *Möll.*
scalaris, *Möll.*
septangularis, *Mont.*
Trevelliana, *Turton.*
turricula, *Mont.*
Vahlii, *Möll.*
violacea, *Mich.*
viridula, *Möll.*
Woodiana, *Möll.*

Genus LACHESIS, Risso.

Shell strong, turreted, many-whorled, the last whorl not very large; surface crossed by longitudinal ribs and transverse striæ; apex of spire mammillated; aperture oval; canal very short, straight, not recurved; outer lip slightly thickened externally, crenated internally,

Syn. Nesæa, Risso. ? Anna, *Risso.*

Ex. L. minima, *Montagu*, pl. 10, fig. 4.

In this genus the animal is said by Philippi to have converging tentacles, a short siphon, and a short ovate foot. The operculum is entire and unguiform; the apex of the spire is mammillated, and there is no sinus in the outer lip.

Species of Lachesis.

candidissima, *C. B. Adams.* minima, *Montagu.*

Sub-fam. CLAVATULINÆ.

Operculum semi-ovate, nucleus in the centre of the straight front edge.

Genus CLAVATULA, Lamarck.

Shell turreted, subfusiform; spire elevated, whorls coronated; aperture oval; canal moderate; columella smooth; outer lip with a marginal notch below its union with the body-whorl, and with a sinus near the canal anteriorly.

Syn. Clavicantha, *Swains.*

Ex. C. imperialis, *Lamarck*, pl. 10, fig. 5. Operculum, C. bimarginata, *Lamarck*, fig. 5, *a*.

Many of the *Clavatulæ* bear a strong resemblance to the genus *Turris*, but they may be readily distinguished by the opercula, which are strikingly different.

Species of Clavatula.

bimarginata, *Lam.*
coronata, *Chem.*
diadema, *Kien.*
gravis, *Hinds.*
imperialis, *Lam.*
implicata, *Reeve.*
mystica, *Reeve.*
punctata, *Reeve.*
sacerdos, *Reeve.*
taxus, *Chem.*
virginea, *Chem.*

Genus PERRONA, Schumacher.

Shell fusiform, smooth; spire short, of few whorls; aperture narrow; canal long; outer lip with a wide shallow sinus near the middle; inner lip with a thick callosity at the hind part near the suture.

Syn. Tomella, *Swain.*

Ex. P. lineata, *Lamarck*, pl. 10, fig. 6. Operculum, P. lineata, fig. 6, *a*.

The species of *Perrona* are smooth and solid shells, somewhat resembling in appearance small *Clavellæ*, with a notch in the middle of the outer lip; the hind part of the body-whorl is gibbous, and the columella, as in that genus, is callous posteriorly.

Species of Perrona.

lineata, *Reeve.*
obesa, *Reeve.*
Perronii, *Chem.*
spirata, *Lam.*

Sub-fam. DEFRANCIINÆ.

Operculum none.

Genus DEFRANCIA, Millet.

Shell turreted, fusiform; spire elevated, whorls cancellated; aperture oval; canal short; outer lip with a slight emargination or sinus at its junction with the body-whorl.

Ex. D. teres, *Forbes*, pl. 10, fig. 7. Shell, D. linearis, *Montagu*, fig. 7, *a*.

Defrancia may be considered as cancellated *Mangeliæ*, with the body-whorl more ventricose, and the canal slightly more evident. The want of operculum, and the nature of the emargination of the outer lip, at once distinguish it from *Clavatula*, and the texture and sculpture of surface from *Bela* and *Daphnella*.

Species of Defrancia.

abyssicola, *Forbes*.
albibalteata, *Reeve*.
albicans, *Hinds*.
albifuniculata, *Reeve*.
amabilis, *Hinds*.
angulifera, *Reeve*.
apicata, *Gray*.
arata, *Reeve*.
arctata, *Reeve*.
argillacea, *Hinds*.
aspera, *Hinds*.
bicanalifera, *Sow*.
bicarinata, *Couth*.
cælata, *Hinds*.
canaliculata, *Reeve*.
cancellata, *Gray*.
candida, *Hinds*.
candidula, *Reeve*.
cardinalis, *Reeve*.
cavernosa, *Reeve*.
cinerea, *Hinds*.
clathrata, *Reeve*.
compta, *Reeve*.
concentricostata, *Reeve*.
costata, *Gray*.
crassilabrum, *Reeve*.
Cycladensis, *Forbes*.
dædala, *Reeve*.

debilis, *Hinds.*
Delosensis, *Reeve.*
dentifera, *Hinds.*
despecta, *H. and A. Adams.*
(neglecta, *C. B. Adams*).
donata, *Hinds.*
D'Orbygnii, *Reeve.*
Dorvilliæ, *Gray.*
efficta, *Reeve.*
ericea, *Hinds.*
eximia, *Reeve.*
fimbriata, *Hinds.*
flammea, *Hinds.*
Forbesii, *Reeve.*
foraminata, *Reeve.*
Forthiensis, *Reeve.*
foveolata, *Reeve.*
fusoides, *Reeve.*
glumacæa, *Hinds.*
granicostata, *Reeve.*
Grayi, *Reeve.*
Guildingii, *Reeve.*
Hindsii, *Reeve.*
languida, *Reeve.*
laqueata, *Reeve.*
Leufroyi, *Mich.*
linearis, *Mont.*
lineolata, *Gray.*
lirata, *Reeve.*
luteo-fasciata, *Reeve.*
macrostoma, *Reeve.*
maculata, *C. B. Adams.*
margaritifera, *Gray.*
marmorosa, *Reeve.*
merita, *Hinds.*
Metcalfiana, *Reeve.*
metula, *Hinds.*
micans, *Hinds.*
minor, *C. B. Adams.*
minuta, *Forbes.*
mucronata, *Reeve.*
multiplicata, *Reeve.*
nassoides, *Gray.*
nana, *Lovén.*
neglecta, *Hinds.*
nexa, *Reeve.*
obesicostata, *Reeve.*
obtusa, *Reeve.*
occata, *Hinds.*
occidentalis, *Reeve.*
pagodus, *Reeve.*
parvula, *Reeve.*
pellis-phocæ, *Reeve.*
Philberti, *Mich.*
planilabrum, *Reeve.*
Polynesiensis, *Reeve.*
puncticincta, *Reeve.*
purpurea, *Mont.*
pygmæa, *C. B. Adams.*
pyramidula, *Reeve.*
quadrata, *Reeve.*
quadriliniata, *C. B. Adams.*
quisqualis, *Hinds.*
rana, *Hinds.*
reticulata, *Brown.*
retusa, *Hinds.*
rigida, *Hinds.*
rosaria, *Reeve.*
rubida, *Hinds.*
rubricata, *Reeve.*
saturata, *Reeve.*
scalaris, *Hinds.*
scalpta, *Reeve.*
sculpta, *Hinds.*
semigranosa, *Reeve.*
sinuosa, *Gray.*
spurca, *Hinds.*
teres, *Forbes.*

tessellata, *Hinds.* ...
tincta, *Reeve.*
tricarinata, *Valenc.*
trifasciata, *Gray.*
tritonoides, *Reeve.*
turbinelloides, *Reeve.*
turris, *Reeve.*
variculosa, *Sow.*
vultuosa, *Reeve.*

Genus DAPHNELLA, Hinds.

Shell fusiform, thin, fragile, surface usually striated; spire elevated, last whorl elongated; aperture oblong-oval, slightly channelled in front; columella simple; outer lip acute, separated from the last whorl so as to leave a sinus.

Ex. D. ornata, *Hinds*, pl. 10, fig. 8.

This genus comprises a suite of small and elegant shells, of slight texture. In form they somewhat resemble *Metula*, but the separation of the outer lip from the body-whorl, leaving a tolerably wide sinus, will distinguish them from it; from *Defrancia* they may be known by their elongated body-whorl, tenuity, and sculpture.

Species of Daphnella.

ægrota, *Reeve.*
aureola, *Reeve.*
axis, *Reeve.*
Boholensis, *Reeve.*
casta, *Hinds.*
crebriplicata, *Reeve.*
Cumingii, *Powis.*
decorata, *C. B. Adams.*
delicata, *Reeve.*
fenestrata, *Reeve.*
fragilis, *Reeve.*
hyalina, *Reeve.*
igniflua, *Reeve.*
inquinata, *Reeve.*
lactea, *Reeve.*
lymnææformis, *Kien.*
marmorata, *Hinds.*
olyra, *Reeve.*
ornata, *Hinds.*
patula, *Reeve.*
Philippinensis, *Reeve.*
pluricarinata, *Reeve.*
subula, *Reeve.*
Ticaonica, *Reeve.*

Genus CYTHARA, Schumacher.

Margin of mantle slightly dilated on the right side.

Shell fusiform, smooth, longitudinally plicated or ribbed; aperture linear, posteriorly subemarginate; canal very short, nearly straight; columella subflexuous, transversely striated; inner lip posteriorly callous; outer lip margined, denticulate, or striated internally.

Syn. Mangelia (part), *Reeve.*

Ex. C. marginelloides, *Reeve*, pl. 10, fig. 9. Shell, C. citharella, *Lamarck*, fig. 9, *a*.

This genus, usually confounded with *Mangelia*, in the slight dilatation of the mantle margin, in the short spire, and in the corrugated inner and thickened outer lips, somewhat resembles *Morum* among the *Cassididæ:* the species are all rather small, but numerous.

Species of Cythara.

abyssicola, *Reeve.*
angulata, *Reeve.*
Antillarum, *Reeve.*
astricta, *Reeve.*
balteata, *Reeve.*
bicolor, *Reeve.*
capillacea, *Reeve.*
castanea, *Reeve.*
cavernosa, *Reeve.*
Celebensis, *Hinds.*
cincta, *Reeve.*
cinnamomea, *Reeve.*
citharella, *Lam.*
columbelloides, *Reeve.*
corniformis, *Gray.*
conohelicoides, *Reeve.*
coronata, *Reeve.*
crassilabrum, *Reeve.*
cylindrica, *Reeve.*
derelicta, *Reeve.*
digitalis, *Reeve.*
Dysoni, *Reeve.*
elegans, *Reeve.*
fasciata, *Reeve.*
funebris, *Reeve.*
funiculata, *Reeve.*
fusiformis, *Reeve.*
gibbosa, *Reeve.*
Goodallii, *Gray.*
gracilis, *Reeve.*

Hornbeckii, *Reeve.*
interrupta, *Reeve.*
lamellata, *Reeve.*
lyra, *Reeve.*
lyrica, *Reeve.*
marginelloides, *Reeve.*
marmorosa, *Reeve.*
nana, *Reeve.*
Novæ Hollandiæ, *Reeve.*
obesa, *Reeve.*
oryza, *Hinds.*
pellucida, *Reeve.*
planilabrum, *Reeve.*
ponderosa, *Reeve.*
pulchella, *Reeve.*
reticulata, *Reeve.*
rigida, *Reeve.*
solida, *Reeve.*
stromboides, *Reeve.*
tenebrosa, *Reeve.*
triticea, *Kien.*
turricula, *Reeve.*
vexillum, *Reeve.*
zonata, *Reeve.*
trivittata, *Adams and Reeve.*

Genus MANGELIA, Leach.

Shell solid, fusiform, smooth or longitudinally ribbed; aperture linear, with scarcely any canal in front; columella smooth, simple; outer lip acute, with a slight sinus posteriorly, near the suture.

Syn. Raphitoma, *Bell.*

Ex. M. nebula, *Montagu*, pl. 10, fig. 10. Shell, M. striolata, *Scacchi*, fig. 10, *a*.

The genus most likely to be confounded with *Mangelia* is *Cythara* of Schumacher, from which, however, it may readily be distinguished by the spire being longer than the aperture, by the columella being smooth and not transversely corrugated, and by the outer lip being thin and not crenate internally. There are many recent species, chiefly from tropical seas.

Species of Mangelia.

Ægeensis, *Forbes.*
æruginosa, *Reeve.*
affinis, *Gray.*
albovittata, *C. B. Adams.*
angicostata, *Reeve.*
attenuata, *Mont.*

badia, *Reeve.*
bella, *Hinds.*
Bertrandi, *Payr.*
biconica, *C. B. Adams.*
brevis, *C. B. Adams.*
casta, *Reeve.*
cinctella, *Pfeiff.*
cinnamonea, *Hinds.*
cithara, *Gould.*
clara, *Reeve.*
coarctata, *Forbes.*
contracta, *Reeve.*
cornea, *Reeve.*
costata, *Penn.*
crassicostata, *C. B. Adams.*
densistriata, *C. B. Adams.*
dubia, *C. B. Adams.*
ebur, *Reeve.*
formicaria, *Sow.*
fortis, *Forbes.*
fulva, *Reeve.*
funestris, *Reeve.*
fusca, *C. B. Adams.*
Ginnannia, *Risso.*
gracilenta, *Reeve.*
gracilis, *Mont.*
Groenlandica, *Reeve.*
hexagonalis, *Reeve.*
lanceolata, *C. B. Adams.*
lævigata, *Phil.*
ligata, *C. B. Adams.*
lineata, *Reeve.*
livida, *Reeve.*
Loeviana, *Forbes.*
Lyciaca, *Forbes.*
maculata, *Reeve.*
Maravignæ, *Bivon.*
multilineata, *Phil.*
muricoides, *C. B. Adams.*
nebula, *Mont.*
nitens, *Hinds.*
obeliscus, *Reeve.*
opalis, *Reeve.*
pallida, *Reeve.*
pentagonalis, *Gray.*
pessulata, *Reeve.*
plumbea, *Hinds.*
polita, *Hinds.*
polyzonata, *H. and A. Adams* (multilineata, *C. B. Ad.*).
pseudo-carinata, *Reeve.*
pura, *Reeve.*
pusilla, *Reeve.*
pyramidalis, *Reeve.*
pyramis, *Hinds.*
semen, *Reeve.*
Sicula, *Reeve.*
sordida, *Reeve.*
striolata, *Scacchi.*
striosa, *C. B. Adams.*
symmetrica, *Reeve.*
tæniata, *Reeve.*
trilineata, *C. B. Adams.*
turgida, *Forbes.*
undaticostata, *Reeve.*
urnula, *Reeve.*
Vauquelinii, *Payr.*
vicina, *C. B. Adams.*
vitrea, *Reeve.*
vittata, *Hinds.*
vulpecula, *Broc.*
Zebuensis, *Reeve.*

Fam. TRITONIIDÆ.

Teeth on lingual membrane in seven rows (3.1.3), central generally toothed; lateral in three series, converging, the inner often broad, the two outer subulate, versatile. Mantle enclosed, siphon straight. Foot small.

Operculum ovate, annular, nucleus subapical.

Shell with varices on the whorls; aperture with a straight canal in front.

The *Tritoniidæ* have been hitherto united with the *Muricidæ*, but the teeth of the latter are in three rows only, while, in this family, they assimilate with the dentition of *Velutinidæ* and *Naticidæ*, where they are arranged in seven series.

Genus TRITONIUM, Link.

Shell oblong; spire prominent, whorls with a few remote and non-continuous varices; columella rough or smooth; canal recurved, short or long; outer lip internally crenated or denticulated.

Syn. Triton, *Montf.*, not *Laur.* Buccinum, *Browne*, not *Linn.* Charonia, *Gistel.*

Ex. T. nodulum, *Martini*, pl. 11, fig. 1. Operculum, T. pileare, *Linnæus*, fig. 1, *a*, 1, *b*. Shell, T. Tritonis, *Linnæus*, fig. 1, *c*.

The Tritons are principally equatorial in their geographical distribution, and belong more especially to the Asiatic fauna. Those with the canal very much produced are obtained from deep water; the cancellated forms are from sand, in deep water; and those covered with an epidermis are chiefly from sandy mud, in from six to thirty fathoms.

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Species of Tritonium.

australe, *Chem.*
fusiforme, *Kien.*
marmoratum, *Link.*
Opis, *Bolt.*
Sauliæ, *Reeve.*
subdistortum, *Lam.*
Tritonis, *Linn.*

Sub-gen. SIMPULUM, Klein (Lampusia, *Schum.* Monoplex *Perry*).

Shell fusiform; whorls nodosely ribbed; outer lip thick, plicato-dentate internally.

aquatile, *Reeve.*
chlorostoma, *Lam.*
corrugatum, *Lam.*
costatum, *Born.*
ficoides, *Reeve.*
gemmatum, *Reeve.*
lignarium, *Brod.*
lineatum, *Brod.*
olearium, *Linn.*
Pfeifferianum, *Reeve.*
pileare, *Linn.*
rubeculum, *Linn.*
Tranquebaricum, *Linn.*
vestitum, *Hinds.*

Sub-gen. CABESTANA, Bolten (Aquilus, *Montf.*).

Shell ventricose, umbilicated; whorls nodosely ribbed; outer lip dentated internally.

Brasilianum, *Gould.*
cutaceum, *Linn.*
doliarium, *Linn.*
labiosum, *Wood.*
Spengleri, *Chem.*

Sub-gen. CYMATIUM, Bolten (Lotorium, *Montf.*).

Whorls triangular, coronated; aperture longer than the spire; outer lip dentated internally.

femorale, *Linn.*
grandimaculatum, *Reeve.*

lotorium, *Linn.*
rhinoceros, *Bolt.*
tigrinum, *Brod.*

Sub-gen. GUTTURNIUM, Klein (Ranularia, *Schum.*).

Shell subturreted; whorls nodosely ribbed; outer lip thick, plicated internally; canal produced.

ægrotum, *Reeve.*
amictum, *Reeve.*
Antillarum, *D'Orb.*
caudatum, *Gmel.*
clavator, *Chem.*
crispum, *Reeve.*
cynocephalum, *Lam.*
elongatum, *Reeve.*
encausticum, *Reeve.*
exaratum, *Reeve.*
exile, *Reeve.*
gallinago, *Reeve.*
gibbosum, *Brod.*
gracile, *Reeve.*
moniliferum, *Adams and Reeve.*
moritinctum, *Reeve.*
nodulum, *Mart.*
pyrulum, *Adams and Reeve.*
pyrum, *Lam.*
retusum, *Lam.*
sacrostoma, *Reeve.*
Sinense, *Reeve.*
testudinarium, *Adams and Reeve.*
Thersites, *Reeve.*
trilineatum, *Reeve.*
tripus, *Chem.*
vespaceum, *Lam.*

Sub-gen. EPIDROMUS, Klein (Colubraria, *Schum.* Cumia, *Bivon.*).

Spire longer than the aperture; aperture narrow, contracted; outer lip internally crenated.

antiquatum, *Hinds.*
angulatum, *Reeve.*
anomalum, *Hinds.*
bacillum, *Reeve.*
bracteatum, *Hinds.*
Ceylonense, *Sow.*
concinnum, *Reeve.*
convolutum, *Brod.*
decapitatum, *Reeve.*
decollatum, *Sow.*
digitale, *Reeve.*
distortum, *Schub. and Wag.*
eburneum, *Reeve.*
eximium, *Reeve.*
fictile, *Hinds.*
lativaricosum, *Reeve.*
lanceolatum, *Menke.*
limbatum, *Phil.*
maculosum, *Mart.*
nitidulum, *Sow.*

obscurum, *Reeve.*
parvum, *C. B. Adams.*
pictum, *Reeve.*
pygmæum, *Lam.*
Quoyi, *Reeve.*
reticulatum, *Blainv.*
rude, *Meusch.*
scalariforme, *Brod.*
sculptile, *Reeve.*
siphonatum, *Reeve.*
Sowerbii, *Reeve.*
tessellatum, *Reeve.*
testaceum, *Bon.*
tortuosum, *Reeve.*
truncatum, *Hinds.*
verrucosum, *Reeve.*

Sub-gen. LAGENA, Klein.

Shell ventricose, thin; whorls rounded, varices obsolete.

cancellatum, *Lam.*
clandestinum, *Chem.*
Oregonense, *Say.*
rostratum, *Mart.*
Wiegmanni, *Anton.*

Sub-gen. ARGOBUCCINUM, Klein.

Shell ventricose, solid; whorls rounded, varices few; canal short; outer lip dentated internally.

rude, *Brod.*
scabrum, *King.*

Genus DISTORSIO, Bolten.

Shell subturreted; whorls distorted; aperture irregular, contracted, ringent; canal recurved; inner lip dilated, lamellar, rugosely indented; columella excavated, verrucosely plicate; outer lip sinuous, internally plicato-dentate.

Syn. Persona, *Montf.* Distorta, *Schum.* Distortrix, *Link.*

Ex. D. cancellina, *Deshayes*, pl. 11, fig. 2. Operculum, D. anus, *Linnæus*, fig. 2, *a*, 2, *b*. Shell D. anus, fig. 2, *c*.

These remarkable shells are at once recognised by the ringent aspect of their mouths, from which circumstance

they have been termed mask-shells; they are not numerous in species, and inhabit sandy mud in rather deep water.

Species of Distorsio.

anus, *Linn.*
cancellina, *Desh.*
constricta, *Brod.*
decipiens, *Reeve.*
reticulata, *Linn.*
ridens, *Reeve.*

Genus BURSA, Bolten.

Shell ovate or oblong, compressed, with two rows of continuous varices, one on each side; aperture oval; columella arcuated, and ridged or crenulated; canal short, recuvred; outer lip crenated.

Syn. Ranella, *Lam.* Gyrineum, *Link.* Bufo, *Montf.* Biplex, *Perry.* Rana, *Humph.* Bufonaria, *Schum.*

* *Ex.* B. rana, *Linnæus*, pl. 11, fig. 3; Operculum, B. pusilla, *Broderip*, fig. 3, *a*, 3, *b*. Shell, B. rana, fig. 3, *c*.

The species of *Bursa* are mostly tropical, the majority being from the Eastern seas; they are found, when variegated and with nodose armature, in rocky places and on coral reefs; the winged species, with a smoother surface, are from deep water. They move about with considerable animation, and crawl rapidly.

Species of Bursa.

albifasciata, *Sow.*
bufonia, *Bolt.*
crassa, *Desh.*
crumena, *Lam.*
elegans, *Beck.*
foliata, *Brod.*
margaritula, *Desh.*
nana, *Sow.*
nobilis, *Reeve.*
rana, *Linn.*
Suesonii, *Morch.*
subgranosa, *Beck.*

Sub-gen. LAMPAS, Schumacher.

Shell turreted; whorls nodose; canal very short and recurved.

affinis, *Brod.*
bitubercularis, *Lam.*
bufo, *Chem.*
cælata, *Brod.*
Californica, *Hinds.*
coriacea, *Reeve.*
cruentata, *Sow.*
hians, *Schum.*
livida, *Reeve.*
ponderosa, *Reeve.*
pustulosa, *Reeve.*
ranelloides, *Reeve.*
rhodostoma, *Beck.*
rubeta, *Linn.*
rugosa, *Sow.*
scrobiculator, *Linn.*
semigranosa, *Lam.*
siphonata, *Reeve.*
tuberosissima, *Reeve.*
ventricosa, *Brod.*
venustula, *Reeve.*
verrucosa, *Sow.*

Sub-gen. ASPA, H. and A. Adams.

Shell ovate, ventricose, smooth; spire very short; whorls nodulous at the angles.

lævigata, *Lam.*

Sub-gen. APOLLON, Montfort (Gyrina, *Schum.*).

Spine elevated; front canal short; posterior canal wanting.

anceps, *Lam.*
Argus, *Lam.*
candisata, *Chem.*
clathrata, *Gray.*
cuspidata, *Reeve.*
granularis, *Bolt.*
gyrina, *Linn.*
hastula, *Reeve.*
leucostoma, *Lam.*
olearia, *Linn.*
olivator, *Meusch.*
plicata, *Reeve.*
pusilla, *Brod.*
quercina, *List.*
rosea, *Reeve.*
Thersites, *Redf.*
vexillum, *Sow.*

Sub-gen. EUPLEURA, H. and A. Adams.

Spire moderate; front canal long, nearly closed; no posterior canal; inner lip smooth; varices spiny, fimbriated between the spines.

caudata, *Say.*
muriciformis, *Brod.*
nitida, *Brod.*
pectinata, *Hinds.*
pulchra, *Gray.*
triquetra, *Reeve.*

Fam. BUCCINIDÆ.

Teeth on lingual membrane in three series (1.1.1), the central broad, the lateral versatile; lateral teeth flat, with a bent-up process at the end, more or less at right angles with the base. Mantle enclosed; siphon recurved. Foot simple.

Shell usually with an oblique fissure or notch at the fore part of the aperture; aperture sometimes more or less produced and recurved anteriorly.

Sub-fam. BUCCININÆ.

Operculum ovate, nucleus small, near the outer front edge.

In this sub-family the eyes are on slight eminences near the outer bases of the tentacles, and the spire of the shell is usually as long as the aperture.

Genus BUCCINUM, Linnæus.

Eyes at the base of the tentacles.

Shell ovate or oblong, covered with a horny epidermis;

spire elevated, apex acute; aperture large, oval, emarginate in front; canal wide, truncated, dorsally more or less tumid; columella smooth; inner lip expanded; outer lip usually thin, smooth internally.

Ex. B. undatum, *Linnæus*, pl. 11, fig. 4. Operculum, B. undatum, fig. 4, *a*, 4, *b*. Shell, B. undatum, fig. 4, *c*.

Syn. Tritonium, *O. Fabr.*, not *Link*. Halia, *Macgill.*, not *Risso*.

The species of *Buccinum* are not very numerous, and are found chiefly in the polar regions of both northern and southern hemispheres; the shells of the males are generally smaller and less ventricose than those of the females. The Whelk (*B. undatum*) is dredged for the market and used as bait by fishermen.

Species of Buccinum.

acuminatum, *Brod.*
angulosum, *Gray.*
boreale, *Leach.*
ciliatum, *Fabr.*
cretaceum, *Reeve.*
Dalei, *Sow.*
Donovani, *Gray.*
effusum, *Reeve.*
glaciale, *Linn.*
Groenlandicum, *Hancock.*
Humphreysianum, *Bennet.*
hydrophanum, *Hancock.*
imperiale, *Reeve.*
Labradorense, *Reeve.*
Lamarckii, *Kien.*
pyramidale, *Reeve.*
scalariforme, *Beck.*
sericatum, *Hancock.*
tenebrosum, *Hancock.*
tenue, *Gray.*
tortuosum, *Reeve.*
tubulosum, *Reeve.*
undatum, *Linn.*
Zealandicum, *Reeve.*

Sub-fam. NASSINÆ.

Operculum ovate, acute, nucleus apical, the margin entire or serrated.

The eyes in some of the genera are near the base of the

tentacles, in others near their middle, and are sometimes wanting; the aperture of the shell is either truncate, or with a short recurved canal, and the inner lip is usually callous and spreading over the last whorl.

Genus EBURNA, Lamarck.

Head long and flat; eyes on swellings at the base of the tentacles. Foot narrow, elongate.

Shell ovate-oblong, deeply umbilicated; spire acuminated, whorls more or less convex, suture more or less channelled; aperture oval; columella arcuated, posteriorly callous; inner lip spreading, often covering the umbilicus in the adult; outer lip simple, acute.

Syn. Latrunculus, *Gray*. Nassa, *a*, *Schum*. Babylonia, *Schlüt*.

Ex. E. spirata, *Linnæus*, pl. 11, fig. 5. Operculum, E., canaliculata, *Schumacher*, fig. 5, *a*, 5, *b*. Shell, E. canaliculata, fig. 5, *c*.

The *Eburnæ* are solid, smooth shells, spotted with dark red; they are found in the Red Sea, India, the Cape, Japan, China, and Australia; when fresh they are covered with a very thin, brown, horny epidermis.

Species of Eburna.

ambulacrum, *Sow.*
canaliculata, *Schum.*
Japonica, *Reeve.*
maculosa, *Bolt.*
Molliana, *Chem.*
papillaris, *Sow.*
spirata, *Linn.*
Valentiana, *Swains.*

Sub-gen. ZEMIRA, H. and A. Adams.

Umbilicus moderate; outer lip with a tooth near the fore part.

australis, *Sow.*

Genus COMINELLA, Gray.

Shell bucciniform, marked or spotted, covered with an epidermis; spire short, acute, last whorl large, ventricose, with a posterior depressed groove at the suture, producing a contraction at the hind part of the outer lip.

Ex. C. virgata, *H. and A. Adams*, pl. 11, fig. 6. Operculum, C. maculata, *Martini*, fig. 6, *a*, 6, *b*. Shell, C. limbosa, *Lamarck*, fig. 6, *c*.

These shells have usually been confounded with *Purpura* and *Buccinum*; the operculum, however, will distinguish them from the former, and the position of the eyes from the latter.

Species of Cominella.

acutinodosa, *Reeve.*
alveolata, *Kien.*
Anglicana, *Mart.*
bimucronata, *Reeve.*
citrina, *Reeve.*
costata, *Quoy and Gaim.*
crassa, *Adams.*
cyanea, *Gray.*
Delalandii, *Kien.*
dubia, *Krauss.*
eburnea, *Reeve.*
Grateloupiana, *Petit.*
glandiformis, *Reeve.*
hinnulus, *Adams and Reeve.*
lagenaria, *Lam.*
limbosa, *Lam.*
linearis, *Reeve.*
lineolata, *Lam.*
livida, *Reeve.*
maculata, *Mart.*
nassoides, *Reeve.*
papyracea, *Brug.*
pluriannulata, *Reeve.*
Quoyi, *Kien.*
testudinea, *Mart.*
tigrina, *Kien.*
ustulata, *Reeve.*
virgata, *H. and A. Adams* (lineolata, *Quoy and Gaim.*).

Sub-gen. AMPHISSA, H. and A. Adams.

Shell with the aperture anteriorly dilated, the contraction near the spire obsolete.

corrugata, *Reeve.* intincta, *Reeve.*

Genus NORTHIA, Gray.

Shell elongated, turreted, polished; spire elevated, acuminated, whorls depressed and sloping at their upper part; aperture shorter than the spire; outer lip with the margin serrated.

Ex. N. serrata, *Dufresne*, Pl. 12, fig. 1. Operculum, N. serrata, fig. 1, *a*, 1, *b*.

This genus is of limited extent; one species has been described by Mr. Reeve, under the name of *Pleurotoma rissoides*, and another in the "Zoology of the Voyage of H.M.S. Samarang," under that of *Buccinum albopunctatum*. The large and typical species, *Nassa serrata* of M. Dufresne, was formerly much prized by collectors, and inhabits the shores of California.

Species of Northia.

albopunctata, *Adams and Reeve.* rissoides, *Reeve.*
serrata, *Dufresne.*

Genus TRUNCARIA, Adams and Reeve.

Shell acuminately oblong, thick; suture of the spire channelled; aperture anteriorly dilated, posteriorly sub-

emarginated; columella arcuated, abruptly truncated in front, with a single anterior fold.

Ex. T. filosa, *Adams and Reeve*, pl. 12, fig. 2.

This genus is founded on a singular shell discovered during the voyage of H.M.S. Samarang, and is principally characterised by the abrupt truncature of the columella, and by its anteriorly dilated aperture. The species serving as the type is the *Buccinum filosum*, Adams and Reeve.

Species of Truncaria.

filosa, *Adams and Reeve.*
modesta, *Powis.*
rugata, *Reeve.*
sulcata, *Kien.*
trifasciata, *A. Adams.*

Genus BULLIA, Gray.

Animal without eyes; tentacles long and slender. Foot greatly expanded, and bifid behind.

Shell ovate or turreted; spire more or less acuminated, sutures enamelled; inner lip excavated in the middle, callous posteriorly; aperture oval, moderate.

Syn. Bulliana, *Mrs. Gray.*

Ex. B. lævigata, *Martini*, pl. 12, fig. 3. Shell, B. lævigata, fig. 3, *a*.

Bullia has a raised band of enamel round the sutures of the whorls, formed by the hinder part of the inner lip of the shell extending beyond the mouth, as in *Ancilla*. It has the faculty, according to M. Quoy, of absorbing, through the pores of its foot, a great quantity of water, which it ejects, when disturbed, in various directions; it is caught by baiting lines with bits of flesh: most of the species are African.

Species of Bullia.

annulata, *Lam.*
callosa, *Wood.*
deformis, *King.*
digitalis, *Meusch.*
globulosa, *Kien.*
Grayi, *Reeve.*
lymnæana, *A. Adams.*
lævigata, *Mart.*
Mauritiana, *Gray.*
rhodostoma, *Gray.*
semiflammea, *Reeve.*
semiusta, *Reeve.*
semiplicata, *Gray.*
squalida, *King.*
sulcata, *Reeve.*
tenuis, *Gray.*

Sub-gen. BUCCIANOPS, D'Orbigny.

Shell with the whorls somewhat angulated, and with a rounded or nodulous band next the sutures.

armata, *Gray.*
cochlidium, *Kien.*
gradata, *Desh.*

Genus PSEUDOSTROMBUS, Klein.

Foot moderate, simple posteriorly.

Shell elongated, smooth, without epidermis, last whorl ventricose; spire acuminate; aperture ovate; columella arched, smooth; outer lip thin.

Syn. Dorsanum, *Gray.*

Ex. P. politus, *Lamarck*, pl. 12, fig. 4. Shell, P. Tranquebaricus, *Bolten*, fig. 4, *a*.

The shell of *Pseudostrombus* chiefly differs from that of *Bullia* in the absence of the band of enamel round the sutures of the spire.

Species of Pseudostrombus.

Malabaricus, *Hanley.*
politus, *Lam.*
vitreus, *Reeve.*

Sub-gen. LEIODOMUS, Swainson.

Shell turreted; whorls convex, transversely striated.

Taheitensis, *Gray.*
Tranquebaricus, *Bolt.*
turritus, *Gray.*
velatus, *Gould.*
vittatus, *Linn.*

Sub-gen. ADINUS, H. and A. Adams.

Shell subulate, spirally striated; columella abruptly truncate at base; inner lip corrugated, with a callosity at hind part; outer lip grooved internally, externally marginated.

truncatus, *Reeve.*
ictericus, *Soland.*

Genus PHOS, Montfort.

Tentacles connate at the base, eyes near their tips. Foot with an auriculate shield-like lobe in front, and ending behind in a single tapering filament.

Shell cancellated, oblong, acuminated, usually longitudinally ribbed; outer lip striated internally, with a slight sinus near the fore part; columella obliquely grooved, or with a single plait in front.

Syn. Rhinodomus, *Swains.*

Ex. P. textum, *Gmelin*, pl. 12, fig. 5. Operculum, P. lævigatus, *A. Adams*, fig. 5, *a*, 5, *b*. Shell, P. senticosus, *Linnæus*, fig. 5, *c*.

The great peculiarity of *Phos* is the circumstance of the hind part of the foot ending in a tapering filament instead of being simple as in *Buccinum*, or bifid as in *Nassa*. The columella, anteriorly, has a single fold, and there is a notch at the fore part of the outer lip; the canal is never elongate or recurved as in *Nassaria*.

Species of Phos.

articulatus, *Hinds.*
cancellatus, *A. Adams.*
Cumingii, *Reeve.*
fasciatus, *A. Adams.*
filosus, *A. Adams.*
gaudens, *Hinds.*
lævigatus, *A. Adams.*
ligatus, *A. Adams.*
nodicostatus, *A. Adams.*
plicatus, *A. Adams.*
reticosus, *Hinds.*
roseatus, *Hinds.*
rufocinctus, *A. Adams.*
scalarioides, *A. Adams.*
senticosus, *Linn.*
turritus, *A. Adams.*
varicosus, *A. Adams.*
Veraguensis, *Hinds.*
virgatus, *Hinds.*

Sub-gen. STRONGYLOCERA, Mörch.

Shell with the whorls angulated, the upper part concave; aperture contracted.

cancellatus, *Quoy and Gaimard.*
crassus, *Hinds.*
cyanostoma, *A. Adams.*
cyllenoides, *A. Adams.*
sculptilis, *A. Adams.*
spinicostatus, *A. Adams.*
textilinus, *Mörch.*
textilis, *A. Adams.*
textum, *Gmel.*

Genus DESMOULEA, Gray.

Shell ovate-globose, covered with a downy epidermis; spire short, conical, apex papillary, whorls depressed; aperture ovate; inner lip thickened, with a ridge posteriorly; outer lip contracted, thickened externally, plicated internally.

Ex. D. pinguis, *A. Adams*, pl. 12, fig. 6. Operculum, D. pinguis, fig. 6, *a*.

Desmoulea is remarkable for its obtuse apex and solid growth. There are eight species described, but the animal is not yet known; when in fine condition they are covered

with a velvety epidermis, and some of the species are ornamented with red and brown markings.

Species of Desmoulea.

abbreviata, *Chem.*
crassa, *A. Adams.*
Japonica, *A. Adams.*
obtusa, *Chem.*
pinguis, *A. Adams.*
pulchra, *Gray.*
pyramidalis, *A. Adams.*
ventricosa, *Lam.*

Genus NASSA, Martini.

Eyes on the middle of the tentacles; lingual teeth arched, pectinated; uncini with a basal tooth. Foot large, expanded, bifurcate at its posterior extremity.

Operculum ovate, the margin serrated or entire.

Shell ovate, ventricose, body-whorl variously sculptured; aperture ovate, with a short reflected truncated anterior canal; inner lip smooth, often widely spread over with enamel, with a posterior callosity or blunt dentiform plait; outer lip dentated, internally crenulated.

Ex. N. lævis, *Chemnitz*, pl. 12, fig. 7. Operculum, N. dispar, *A. Adams*, fig. 7, *a*, 7, *b*. Shell, N. lævis, fig. 7, *c*.

The *Nassæ*, remarkable for their bifid foot, are extremely active and vivacious in their movements, feeding on bivalves, which they pierce with their proboscis, extracting the contents through a small round aperture.

Species of Nassa.

arcularia, *Linn.*
Bronnii, *Phil.*
coronata, *Brug.*
coronula, *A. Adams.*
delicata, *A. Adams.*
dispar, *A. Adams.*
fissilabris, *A. Adams.*
mutabilis, *Linn.*

nodicostata, *A. Adams.*
plicata, *Bolt.*
pullus, *Linn.*
pusio, *A. Adams.*
scalariformis, *Chem.*
sinusigera, *A. Adams.*
sulcifera, *A. Adams.*
velicata, *Meusch.*

Sub-gen. NIOTHA, H. and A. Adams.

Shell cassidiform; spire short, whorls granulated or cancellated; inner lip with the callus very large and spreading; outer lip crenate, not variced externally.

acinosa, *Gould.*
albescens, *Dkr.*
australis, *A. Adams.*
abyssicola, *A. Adams.*
Bouchardi, *Dkr.*
caperata, *Phil.*
crenilirata, *A. Adams.*
crenellifera, *A. Adams.*
costata, *A. Adams.*
candens, *Hinds.*
cremata, *Hinds.*
cælata, *A. Adams.*
Cumingii, *A. Adams.*
gemma, *Phil.*
gemmulifera, *A. Adams.*
gemmulata, *Lam.*
gemmulosa, *C. B. Adams.*
Isabellei, *D'Orb.*
Jonasi, *Dkr.*
livescens, *Phil.*
Lyulla, *Beck.*
margaritifera, *Dkr.*
marginulata, *Lam.*
mendica, *Gould.*
multicostata, *A. Adams.*
myristica, *Hinds.*
pauperata, *Lam.*
plicatella, *A. Adams.*
ravida, *A. Adams.*
reticosa, *A. Adams.*
semigranosa, *Dkr.*
semigranulata, *Dkr.*
sinusigera, *A. Adams.*
Siquijorensis, *A. Adams.*
sordida, *A. Adams.*
splendidula, *Dkr.*
stigmataria, *A. Adams.*
variegata, *A. Adams.*
verrucosa, *A. Adams.*
Webbei, *Petit.*

Sub-gen. PHRONTIS, H. and A. Adams.

Spire elevated, acuminate, whorls ribbed or nodulose; inner lip smooth, with an extended, thickened callus.

complanata, *Powis.*
corticata, *A. Adams.*
crassa, *Koch.*
fasciata, *Chem.*

lineata, *Pult.*
nodulifera, *Phil.*
Stimpsoniana, *C. B. Adams.*
Sturmii, *Phil.*
tiarula, *Kien.*
venusta, *Dkr.*
Wilsoni, *C. B. Adams.*
xanthostoma, *Gray.*
zonalis, *Brug.*

Sub-gen. ARCULARIA, Link (Eione, *Risso*).

Body-whorl gibbose on the back; spire produced; callus of inner lip greatly extended and covering the spire.

bellula, *A. Adams.*
bimaculosa, *A. Adams.*
callispira, *A. Adams.*
callosa, *A. Adams.*
cancellata, *A. Adams.*
circumcincta, *A. Adams.*
clathrata, *Kien.*
dorsuosa, *A. Adams.*
gibbosula, *Linn.*
granifera, *Kien.*
Kraussiana, *Dkr.*
labecula, *A. Adams.*
leptospira, *A. Adams.*
nana, *A. Adams.*
orbiculata, *A. Adams.*
Thersites, *Brug.*
verrucosa, *Brug.*

Sub-gen. NAYTIA, H. and A. Adams.

Shell smooth; aperture with a channel at the hind part continued up the spire.

glabrata, *Sow.*
grana, *Lam.*

Sub-gen. ALECTRION, Montfort (Monoceros, *Flem.*, not *Lam.*).

Spire elevated, whorls glabrous, polished or papillary; inner lip spreading; outer lip denticulate, not variced externally.

elegans, *Kien.*
glans, *Linn.*
hepatica, *Pult.*
hirta, *Kien.*
læta, *Phil.*
papillosa, *Linn.*
scalaris, *A. Adams.*
seminodosa, *A. Adams.*
spirata, *A. Adams.*
suturalis, *Lam.*
Jacksoniana, *Kien.*

Sub-gen. ZEUXIS, H. and A. Adams.

Spire elevated, whorls covered with an epidermis, smooth, or longitudinally plicate; inner lip with the callus defined; outer lip externally variced, dentate anteriorly.

badia, *A. Adams.*
cinnamomea, *A. Adams.*
compta, *A. Adams.*
concinna, *Powis.*
crenulata, *Brug.*
exilis, *Powis.*
foveolata, *Dkr.*
lævis, *Chem.*
micans, *A. Adams.*
mitralis, *A. Adams.*
pallidula, *A. Adams.*
planicostata, *A. Adams.*
scitula, *A. Adams.*
serotina, *A. Adams.*
sertula, *A. Adams.*
semiplicata, *A. Adams.*
signata, *Dkr.*
succincta, *A. Adams.*
tænia, *Gmel.*
teretiuscula, *A. Adams.*
unicolora, *Kien.*
varicifera, *A. Adams.*
zonalis, *A. Adams.*

Sub-gen. TELASCO, H. and A. Adams.

Spire elevated, whorls smooth, polished; inner lip spreading; outer lip simple, acute.

distorta, *A. Adams.*
filosa, *Gray.*
gaudiosa, *Hinds.*
lentiginosa, *A. Adams.*
luctuosa, *A. Adams.*
mucronata, *A. Adams.*
marmorea, *A. Adams.*
mœsta, *Hinds.*
obliquata, *A. Adams.*
picta, *Dkr.*
punctata, *A. Adams.*
Reeviana, *Dkr.*
stolida, *A. Adams.*
striata, *A. Adams.*
variabilis, *Phil.*

Sub-gen. CÆSIA, H. and A. Adams.

Spire elevated, whorls rugose or cancellated, rounded; inner lip with the callus defined; outer lip thin, simple.

corrugata, *A. Adams.*
Japonica, *A. Adams.*
limata, *Chem.*
obliquiplicata, *Dkr.*
perpinguis, *Hinds.*
Roissyi, *Desh.*
turrita, *A. Adams.*

Sub-gen. UZITA, H. and A. Adams.

Spire acuminate, whorls striated, longitudinally ribbed or plicate; inner lip with the callus defined, with a single plait at the fore part; outer lip simple.

angulifera, *A. Adams.*
cinctella, *A. Adams.*
clathratula, *A. Adams.*
denticulata, *A. Adams.*
glauca, *C. B. Adams.*
miga, *Adans.*
Morrissii, *Dkr.*
nivea, *A. Adams.*
nodata, *Hinds.*
nodicincta, *A. Adams.*
nodifera, *Powis.*
nucleolus, *Phil.*
nodulifera, *Phil.*
obtusata, *A. Adams.*
pallida, *Powis.*
proxima, *C. B. Adams.*
pulchella, *A. Adams.*
rufocincta, *A. Adams.*
speciosa, *A. Adams.*
striata, *C. B. Adams.*
Sanctæ Helenæ, *A. Adams.*
versicolor, *C. B. Adams.*

Sub-gen. HEBRA, H. and A. Adams.

Spire elevated, whorls spinose, muricated or tubercular; inner lip with the callus defined; outer lip simple, not variced or denticulate.

crenicostata, *A. Adams.*
echinata, *A. Adams.*
geniculata, *A. Adams.*
Gruneri, *Dkr.*

hispida, *A. Adams.*
horrida, *Dkr.*
muricata, *Quoy and Gaim.*
subspinosa, *Lam.*
vibex, *Say.*

Sub-gen. ZAPHON, H. and A. Adams.

Shell bucciniform; spire elevated, whorls rugose; inner lip with a spreading, corrugated callus; outer lip denticulate, lirate internally, not variced externally.

elegans, *Reeve.*

Sub-gen. ACIOULINA, H. and A. Adams.

Shell turreted, polished, smooth or longitudinally plicate; inner lip with the callus sharp, straight, defined; outer lip produced in the middle, variced externally.

costata, *A. Adams.*
glabrata, *A. Adams.*
labiata, *A. Adams.*
maculata, *A. Adams.*
vittata, *A. Adams.*

Sub-gen. HIMA, Leach (Tritonia, *Turton.* Tritonella, *A. Adams*).

Spire elevated, whorls cancellated; inner lip with a rugose callus, callus defined; outer lip with a marginal varix.

ambigua, *Pult.*
canescens, *C. B. Adams.*
collaria, *Gould.*
corpulenta, *C. B. Adams.*
costata, *A. Adams.*
decussata, *Kien.*
dentifera, *Powis.*
fasciata, *Lam.*
festiva, *Powis.*
fuscata, *A. Adams.*
incrassata, *Müll.*
multigranosa, *Dkr.*
paupera, *Gould.*
polygonata, *Lam.*
pygmæa, *Pult.*
scabriuscula, *Powis.*
tritoniformis, *Kien.*
varicifera, *A. Adams.*

Sub-gen. TRITIA, Risso (Planaxis, *Risso*, not *Lam.*).

Spire elevated, whorls reticulated; inner lip smooth, with the callus moderate; outer lip simple, not variced or denticulate.

cancellata, *Chem.*
Cooperi, *Forbes.*
costellifera, *A. Adams.*
dealbata, *A. Adams.*
fossata, *Gould.*
Gayii, *Kien.*
glauca, *C. B. Adams.*
obsoleta, *Say.*
Panamensis, *C. B. Adams.*
reticulata, *Linn.*
trivittata, *Say.*
Woodwardi, *Forbes.*

Genus NERITULA, Plancus.

Shell ovate, depressed, axis distorted; spire flattened, oblique, whorls smooth; aperture depressed; columella smooth; inner lip callous, spread over the body-whorl; outer lip reflected, not denticulate or striated.

Syn. Cyclops, *Montf.* Cyclope, *Risso.* Nana, *b*, *Schum.* Nanina, *Risso.* Cyclonassa, *Swains.* Cyclocyrtia, *Agass.*

Ex. N. neritea, *Linnæus*, pl. 12, fig. 8. Shell, N. neritea, fig. 8, *a*.

In *Neritula* the last whorl is depressed and extends over the penultimate whorl, nearly covering and concealing the spire, which, consequently, appears very obtuse. The animal has a bifid tail similar to that of *Nassa*.

Species of Neritula.

neritea, *Linn.*
pellucida, *Risso.*

Genus TEINOSTOMA, H. and A. Adams.

Shell orbicular, depressed, subspiral, polished, last whorl

rounded at the periphery; umbilical region covered with a large, flat callosity; aperture transverse, rounded, greatly produced and elongated, ending anteriorly in a slightly canaliculated point; inner lip smooth, callous, not emarginate or truncate anteriorly; outer lip thin, simple, not margined or reflected.

Ex. T. politum, *A. Adams*, pl. 12. fig. 9.

This curious little genus very much resembles, at first sight, *Camitia* of Gray, a genus of *Trochidæ*, from which, however, it is readily distinguished. Its true affinity is with *Neritula*, from which it is known by the absence of the notch at the fore part of the aperture, and by the very peculiar elongation of the mouth.

Species of Teinostoma.

anomalum, *C. B. Adams.* politum, *A. Adams.*

Genus NASSARIA, Link.

Animal as in *Phos*, but without the caudal filament.

Shell ovately fusiform; spire acuminated, whorls longitudinally ribbed and cancellated; aperture ending anteriorly in a long recurved canal; inner lip thin, circumscribed, transversely corrugately plicated; outer lip grooved internally.

Syn. Hindsia, *H. and A. Adams.*

Ex. N. alba, *Martini*, pl. 13, fig. 1. Operculum, N. acuminata, *Reeve*, fig. 1, *a*, 1, *b*. Shell, N. acuminata, fig. 1, *c*.

Nassaria resembles a *Phos* with an elongated, subrecurved beak, and has been confounded with *Tritonium*; it,

however, differs from the former genus in the presence of a recurved canal, and from the latter in the eyes being near the tips of the tentacles, and in the produced fore part of the foot, which forms a prominent mentum.

Species of Nassaria.

acuminata, *Reeve.*
alba, *Mart.*
bitubercularis, *A. Adams.*
carduus, *Reeve.*
egregia, *Reeve.*
nassoides, *Reeve.*
nodicostata, *A. Adams.*
pagoda, *Reeve.*
suturalis, *A. Adams.*
varicifera, *A. Adams.*

Genus CYLLENE, Gray.

Operculum ovate, acute.

Shell ovate; spire short, acute, suture canaliculated; columella concave, smooth or finely grooved; outer lip with a slight sinus at the fore part, emarginate posteriorly, grooved internally.

Ex. C. lyrata, *Lamarck*, pl. 13, fig. 2.

The animal of *Cyllene* is at present unknown, but most probably it will be found more to resemble that of this group than that of *Dactylidæ;* the presence of the channelled suture, however, would seem to indicate the existence of a mantle-filament, as in *Dactylus;* the notch at the fore part of the outer lip reminds one of *Phos*, but the general aspect of *Cyllene* is that of a little Volute.

Species of Cyllene.

concinna, *Soland.*
Grayi, *Reeve.*
glabrata, *A. Adams.*
Guillaini, *Petit.*

fuscata, *A. Adams.*
lugubris, *Adams and Reeve.*
lyrata, *Lam.*
Owenii, *Gray.*
pulchella, *Adams and Reeve.*
orientalis, *A. Adams.*
pallida, *A. Adams.*
striata, *A. Adams.*
sulcata, *A. Adams.*

Sub-fam. PURPURINÆ.

Operculum oblong, nucleus elongate, forming the long outer edge.

The eyes in this sub-family are usually placed near the tips of the tentacles; the siphon is short, and the foot moderate. The shell is most frequently oval; the spire shorter than the aperture, and the inner lip broad and more or less flattened.

Genus CHORUS, Gray.

Shell ovate, ventricose; spire elevated; aperture oval, wide; canal straight, produced in front; columella smooth, curved; outer lip with a prominent tooth at the fore part.

Ex. C. monoceros, *Deshayes*, pl. 8, fig. 6. Operculum, C. monoceros, fig. 6, *a*, 6, *b*.

This genus, from the length of the canal, would appear to have a strong affinity with the *Muricidæ*, but the form of the operculum shows that its true place is in the purpuriform division of the *Buccinidæ*.

Species of Chorus.

monoceros, *Desh.*
xanthostoma, *Brod.*

Genus PURPURA, Aldrovandus.

Shell oblong-oval, last whorl large; spire short; aperture ovate, large, with an oblique channel or groove at the fore part; columella flattened; outer lip simple.

Syn. Microtoma, Swains.

Ex. P. lapillus, *Linnæus*, pl. 13, fig. 3. Operculum, P. patula, *Linnæus*, fig. 3, *a*, 3, *b*. Shell, P. Persica, *Linnæus*, fig. 3, *c*.

The *Purpuræ* inhabit the seas both of temperate and tropical climates. Many species produce a fluid which gives a dull crimson dye, whence their name of Purple Shells. Their egg-cases are membranous, oval or spheroidal, sometimes solitary, sometimes united in masses, each sac containing many embryos.

Species of Purpura.

buccinea, *Desh.*
chocolata, *Ducl.*
columellaris, *Lam.*
grisea, *Bolt.*
haustrum, *Mart.*
inerma, *Reeve.*
patula, *Linn.*
Persica, *Lam.*
Rudolphi, *Lam.*

Sub-gen. TRIBULUS, Klein (Thais, *Bolten*).

Spire depressed, whorls simple, the last ventricose; aperture wide; columella arcuated; inner lip excavated, corrugated at the fore part.

aperta, *Blainv.*
Ascensionis, *Quoy.*
Callaoensis, *Gray.*
Carolensis, *Reeve.*
nodosa, *Linn.*
planospira, *Lam.*

Sub-gen. THALESSA, H. and A. Adams.

Spire elevated, whorls spinose, angulated at the upper part; aperture moderate; columella rounded, tubercular in front; outer lip nodulous internally.

affinis, *Reeve.*
alveolata, *Reeve.*
armigera, *Chem.*
bimaculata, *Jonas.*
bitubercularis, *Lam.*
deltoidea, *Lam.*
echinata, *Blainv.*
echinulata, *Lam.*
hippocastanum, *Linn.*
intermedia, *Kien.*
mancinella, *Lam.*
melones, *Ducl.*
pica, *Blainv.*
speciosa, *Valenc.*
tumulosa, *Reeve.*
unifascialis, *Lam.*

Sub-gen. STRAMONITA, Schumacher.

Spire elevated, whorls simple or nodulous; aperture moderate, produced anteriorly; columella rounded, simple in front.

ægrota, *Reeve.*
bicostalis, *Lam.*
biserialis, *Blainv.*
Blainvillii, *Desh.*
cataracta, *Chem.*
Conradi, *Nutt.*
consul, *Chem.*
fasciata, *Reeve.*
Floridiana, *Conrad.*
gigantea, *Reeve.*
hæmastoma, *Linn.*
Janellii, *Kien.*
luteostoma, *Chem.*
Tipoti, *Petit.*
rustica, *Reeve.*

Sub-gen. TROCHIA, Swainson.

Whorls separated by a deep groove; inner lip thickened, convex, striated; aperture with a very short canal.

cingulata, *Linn.*
spiralis, *Reeve.*

Sub-gen. POLYTROPA, Swainson.

Spire acuminate, whorls foliated or tuberculose; inner lip flattened; canal small, oblique; aperture narrowed at the fore part.

analoga, *Forbes.*
attenuata, *Reeve.*
crispata, *Chem.*
decemcostata, *Midd.*
emarginata, *Desh.*
Freycinetii, *Desh.*
fuscata, *Forbes.*
lapillus, *Linn.*
nux, *Reeve.*
ostrina, *Gould.*
rugosa, *Lam.*
scobina, *Quoy.*
septentrionalis, *Reeve.*
squamosa, *Lam.*
succincta, *Lam.*
textilosa, *Lam.*
Wahlbergi, *Krauss.*

Sub-gen. CRONIA, H. and A. Adams.

Shell ovate; spire acuminated; aperture moderate; inner lip callous at the upper part; columella straight, simple anteriorly.

amygdala, *Kien.*

Genus IOPAS, H. and A. Adams.

Shell ovate, rugose, last whorl large; spire acuminate; aperture moderate, emarginate and channelled in front; inner lip covered with a thin enamel, and with a prominent plait-like callosity at the hind part; columella rounded, subtruncate anteriorly; outer lip sinuous, crenate internally.

Ex. I. sertum, *Lamarck,* pl. 13, fig. 4. Operculum, I. sertum, fig. 4, *a.*

This genus resembles *Pisania* among the *Muricidæ,*

but the operculum has a lateral nucleus like that of the other genera in this sub-family.

Species of Iopas.

hederacea, *Mart.*
sertum, *Lam.*
situla, *Reeve.*

Genus VEXILLA, Swainson.

Shell purpuriform; inner lip flattened and depressed; outer lip, when adult, thickened, inflected, and toothed; aperture wide.

Ex. V. vexillum, *Chemnitz*, pl. 13, fig. 5.

Species of Vexilla.

lineata, *A. Adams.*
tæniata, *Powis.*
vexillum, *Chem.*

Genus PENTADACTYLUS, Klein.

Shell ovate, solid; spire short, whorls tubercular or spinous; aperture linear, narrow, contracted by callous projections, with an oblique emarginate canal in front; inner lip wrinkled; outer lip internally with plait-like teeth, often digitate.

Syn. Ricinula, *Lam.* Drupa, *Bolt.*

Ex. P. globosus, *Martini*, pl. 13, fig. 6. Operculum, P. elegans, *Broderip*, fig. 6, *a*, 6, *b*. Shell, P. grossularius, *Bolten*, fig. 6, *c*.

The shells of this genus, usually known under the Lamarckian name of *Ricinula*, may be distinguished by

the spiny or tubercular character of their whorls, their purple ringent apertures, and the digitation of the outer lip, at least in the typical species.

Species of Pentadactylus.

albolabris, *Blainv.*
clathratus, *Lam.*
elegans, *Brod.*
globosus, *Mart.*
grossularius, *Bolt.*
hystrix, *Lam.*
iodostoma, *Lesson.*
Laurentianus, *Petit.*
lobatus, *Blainv.*
ricinus, *Linn.*

Sub-gen. SISTRUM, Montfort (Morula, *Schum.*).

Shell ovate, whorls nodose or spiny; inner lip with a few tubercular folds anteriorly; outer lip thickened and crenulated, internally tuberculate or striated.

albus, *Mart.*
Anaxares, *Ducl.*
asper, *Lam.*
cariosus, *Wood.*
cavernosus, *Reeve.*
chaideus, *Ducl.*
chrysostoma, *Desh.*
concatenatus, *Blainv.*
dealbatus, *Reeve.*
elatus, *Blainv.*
elongatus, *Blainv.*
fiscellum, *Chem.*
funiculatus, *Reeve.*
iostoma, *Reeve.*
monilis, *Chem.*
muricatus, *Reeve.*
musivus, *Kien.*
muticus, *Lam.*
ochrostoma, *Reeve.*
sidereus, *Reeve.*
spectrum, *Reeve.*
spinosus, *H. and A. Adams* (chrysostoma, *Reeve*).
tuberculatus, *Blainv.*
undatus, *Chem.*

Genus ACANTHINA, Fischer.

Shell ovate, last whorl large; spire rather elevated; aperture semilunar; inner lip wide and flattened; outer lip crenated, with a prominent tooth at the fore part.

Syn. Monoceros, *Lam.*, not *Bloch.* Unicornus, *Montf.* Rudolphus, *Chem.* Rudolpha, *Schum.*

Ex. A. striata, *Lamarck*, pl. 13, fig. 7. Operculum, A. unicornis, *Bruguière*, fig. 7, *a*, 7, *b*. Shell, A. calcar, *Martyn*, fig. 7, *c*.

The species of *Acanthina* are most numerous on the South American coasts of the Pacific Ocean; the genus differs from *Purpura* in having a tooth-like spine on the outer lip.

Species of Acanthina.

acuminata, *Sow.*
calcar, *Martyn.*
cornigera, *Blainv.*
cymatium, *Soland.*
glabrata, *Lam.*
grandis, *Gray.*
maculata, *Gray.*
punctata, *Gray.*
spirata, *Blainv.*
striata, *Lam.*
truncata, *Reeve.*
tuberculata, *Gray.*
unicornis, *Brug.*

Genus PSEUDOLIVA, Swainson.

Shell ovate, solid, subglobose; spire very short, suture slightly channelled, whorls tumid round the upper part; aperture oval; canal very short; inner lip arcuated, with a callosity at the hind part; outer lip thin, furnished at the fore part with a small tooth or callosity.

Syn. Gastridium, *Sow.*, not *Modeer.* Gastridia, *Gray.* Pseudodactylus, *Herm.*

Ex. P. lævis, *Martini*, pl. 13, fig. 8. Operculum, P. lævis, fig. 8, *a*, 8, *b*.

Pseudoliva, known only by its shell and operculum, reminds one of *Olivancillaria* among the *Dactylidæ*, but is distinguished by its large purpura-like operculum,

and the tooth on the outer lip. The species are few in number, and come from Africa and California.

Species of Pseudoliva.

lævis, *Mart.*
sepimenta, *Rang.*
striata, *A. Adams.*
zebrina, *A. Adams.*

Sub-gen. MACRON, H. and A. Adams.

Inner lip with the callus defined; columella obliquely wrinkled; spire elevated, suture channelled.

Æthiops, *Reeve.*
Kellettii, *A. Adams.*

Genus PINAXIA, H. and A. Adams.

Shell conical; spire short, acute; aperture oval-oblong, emarginate anteriorly; inner lip flattened, with several transverse plaits in the middle; outer lip acute, grooved internally.

Ex. P. coronata, *A. Adams*, pl. 14, fig. 1.

The singular and pretty little shell on which this genus is founded, is from the Philippines, and is one of the very numerous discoveries in Conchology made by the indefatigable Mr. Cuming during his laborious researches among the reefs and islands of the Philippine Archipelago.

Genus CONCHOPATELLA, Chemnitz.

Shell ovate, last whorl large, expanded; spire very short, obliquely inclined towards the left side; aperture very wide, slightly channelled anteriorly; inner lip flattened; outer lip with two small teeth in front.

Syn. Concholepas, *Favanne.* Conchulus, *Rafin.*

Ex. C. Peruviana, *Lamarck*, pl. 14, fig. 2. Operculum, C. Peruviana, fig. 2, *a*, 2, *b*. Shell, C. Peruviana, fig. 2, *c*.

The only species known of this genus is from Peru; it lives upon the rocks and stones along the shore, and, considering the size of the foot, is, according to D'Orbigny, very inactive; the operculum is very large and thin, and is placed transversely across the hind part of the foot.

Sub-fam. RAPANINÆ.

Operculum ovate, blunt, nucleus elongate, forming the outer or hinder edge.

In this sub-family the shell is usually more or less pyriform, and often produced anteriorly; the spire is short, and the inner lip is convex and smooth.

Genus CUMA, Humphrey.

Shell pyriform; spire elevated, acute, whorls angular or spinose; aperture oval-oblong; columella convex, sometimes with a strong angular tooth in the middle; outer lip acute, grooved internally.

Ex. C. kiosquiformis, *Duclos*, pl. 14, fig. 3. Operculum, C. tectum, *Chemnitz*, fig. 3, *a*, 3, *b*. Shell, C. tectum, fig. 3, *c*.

The operculum of this genus resembles that of *Purpura;* some of the species bear a close affinity to those of *Rhizochilus*, and in the one chosen by Swainson as the type there is a prominent tooth-like projection in the middle of the columellar lip.

Species of Cuma.

Africana, *Mart.*
carinifera, *Lam.*
cuspidata, *Adams and Reeve.*
diadema, *Lam.*
Grateloupiana, *Petit.*
Gravesii, *Brod.*
imperialis, *Blainv.*
kiosquiformis, *Ducl.*
muricina, *Blainv.*
quadrata, *Jonas.*
rugosa, *Quoy.*
sacellum, *Chem.*
tectum, *Chem.*
thiarella, *Lam.*
trigona, *Lam.*

Genus RAPANA, Schumacher.

Shell ventricose, axis perforated to the apex; spire depressed; aperture oval, narrowed anteriorly; canal open, slightly recurved; inner lip reflected, free anteriorly; umbilicus corrugated.

Ex. R. bezoar, *Linnæus*, pl. 14, fig. 4. Operculum, R. bulbosa, *Solander*, fig. 4, *a*, 4, *b*. Shell, R. bezoar, fig. 4, *c*.

The operculum of *Rapana* is of the *Purpura* type, and the shell is ventricose and umbilicated. The animals frequent the coral-reefs of tropical countries, and most probably feed upon the polyps that construct them.

Species of Rapana.

bezoar, *Linn.*
bulbosa, *Soland.*
coronata, *Lam.*
muricata, *Brod.*

Sub-gen. LATIAXIS, Swainson.

Shell with the axis very widely perforate; whorls more or less detached, carinated; aperture trigonal.

Fortuni, *A. Adams.*
Mawæ, *Gray.*
nodosa, *A. Adams.*
pagoda, *Jonas.*

Genus RHIZOCHILUS, Steenstrup.

Shell, when young, free, resembling *Rapana;* when adult, sometimes with more or less irregular, solid, shelly extensions of the outer and inner lips, which clasp the axis of coral, or the surface of neighbouring shells, and at length close the mouth, with the exception of the anterior siphonal canal which is converted into a shelly tube.

Ex. R. antipathicus, *Steenstrup*, pl. 14, fig. 5, 5, *a.*

The remarkable peculiarity of the animal of *Rhizochilus,* at least in the typical species, in becoming permanently fixed, and closing the aperture of the shell, is very anomalous. Like *Pedicularia,* it attaches itself to the axis of coral; it frequently, however, adheres to shells of its own kind. Professor Steenstrup observed it embracing the axis of *Antipathes ericoides,* whence its specific name.

Species of Rhizochilus.

antipathicus, *Steenst.*

Sub-gen. CORALLIOPHILA, H. and A. Adams.

Shell with the outer and inner lips irregular, moderate, not produced into an extended process closing the aperture.

clathratus, *A. Adams.*
costularis, *Blainv.*
D'Orbignyanus, *Petit.*
foveolatus, *C. B. Adams.*
fragilis *A. Adams.*
galea, *Chem.*
gibbosus, *Reeve.*
madreporinus, *A. Adams.*
monodonta, *Quoy and Gaim.*
neritoideus, *Chem.*
osculans, *C. B. Adams.*
pulchellus, *A. Adams.*
scala, *A. Adams.*
scalariformis, *Lam.*
squamulosus, *Reeve.*
suturalis, *A. Adams.*

Genus SEPARATISTA, Gray.

Shell turbinate, subdiscoidal, the first whorls contiguous, the last more or less separated; aperture expanded, slightly angulated, the margin everted; umbilicus very wide, infundibuliform, with the whorls visible as far as the apex.

Syn. ? Lippistes, *Montf.*

Ex. S. Chemnitzii, *A. Adams*, pl. 14, fig. 6.

This curious genus seems somewhat to approach *Rapana* in conformation and texture. One species is from the Philippines, another is from Japan, and Say has described one as a species of *Delphinula*.

Species of Separatista.

Blainvilleana, *Petit.*
Chemnitzii, *A. Adams.*
Grayi, *A. Adams.*
laxa, *Say.*

Genus MELAPIUM, H. and A. Adams.

Shell ovato-pyriform, ventricose, imperforate, porcellanous; spire obsolete, apex papillary; aperture expanded; inner lip with a thick, smooth callus at the hind part; columella twisted anteriorly, with a prominent oblique plait; canal wide, recurved, directed towards the left.

Syn. Pyrula sp., *Lam.*

Ex. M. lineatum, *Lamarck*, pl. 14, fig. 7.

The porcellanous texture of the shell of *Melapium* approximates it to *Pusionella*, from which, however, it is distinguished by its ventricose body-whorl and short papillary spire; from *Rapana* the absence of umbilicus separates it. The animal and operculum are at present unknown.

Genus RAPA, Klein.

Shell thin, globosely pyriform, axis perforate, umbilicus partly concealed by the reflected inner lip; spire obtuse; aperture oblong, produced anteriorly into a wide subrecurved canal.

Syn. Bulbus, *Humph.*, not *Brown.* Rapella, *Swains.*

Ex. R. tenuis, *Martini*, pl. 14, fig. 8.

Rapa differs from *Rapana* not only in the produced canal of the aperture and thin simple whorls, but in the free, reflexed inner lip and moderate umbilicus; the genus at present is known only from its shell.

Genus LEPTOCONCHUS, Rüppell.

Operculum none.

Shell thin, ovate or subglobose; spire depressed, rather obsolete; aperture large, oval; inner lip anteriorly contorted and truncate; outer lip thin, rather expanded.

Ex. L. Peronii, *Lamarck*, pl. 14, fig. 9. Shell, L. Peronii, fig. 9, *a*.

An examination of the animal confirms the statement of Rüppell that there is no operculum. The mantle-margin is greatly thickened and fleshy; the tentacles are small, broad, and united at their bases; the eyes are small and black, on the outer side of the tentacles, near their tips; the foot is small, short, obtuse and rounded behind, with a thin, expanded, disk-like lobe in front, and the siphon is obsolete. The genus differs from *Campulotus* not only in the absence of operculum, but in the shell never forming a long tubular projection of the mouth, as

in that genus. It comprises but few species, which take up their abode in corals and madrepores.

Species of Leptoconchus.

oblongus, *Sow.* Peronii, *Lam.*

Sub-gen. CORALLIOBIA, H. and A. Adams.

Shell with the spire obsolete, sublateral, last whorl large, lamellose; aperture very wide, simple anteriorly; outer lip expanded, fimbriated.

fimbriatus. *A. Adams.*

Genus CAMPULOTUS, Guettard.

Mantle-margin thickened, siphon very short. Foot large, fleshy, oval.

Operculum ovate, nucleus sublateral.

Shell, when young, spiral, thin; when adult, white, solid, tubular, spiral for three or four whorls, the last turn prolonged into an irregular, straight or flexuous tube, solid posteriorly, and with a siphonal keel on the left side.

Syn. Magilus, *Montf.* Tubulites, *Davilla.* Spirobranchus, *Blainv.*

Ex. C. antiquus, *Montfort*, pl. 14, fig. 10. Operculum, C. antiquus, fig. 10, *a*, 10, *b*. Shell, C. antiquus, fig. 10, *c*.

This curious genus lives in coral, and the inordinate extension of the lips of the shell is to enable the animal to keep on a level with the surface of the coral as it continues to increase in size; as the shell grows, the tube behind is filled up with solid calcareous matter.

Fam. DACTYLIDÆ.

Teeth on lingual membrane in three series (1·1·1), the central broad, the lateral versatile. Mantle enclosed, the siphon recurved. Foot voluminous, usually reflexed over the sides of the shell, and fissured on each side in front.

Operculum small, often wanting or rudimentary.

Shell porcellanous, usually polished, last whorl often enrolled round the others; aperture ending anteriorly in an oblique fissure.

The operculum is absent in *Harpa* and *Dactylus*, and also in some of the ventricose species of *Ancillæ* with wide apertures; but in *Olivella*, and in many of the smaller *Ancillæ*, it is always present, though of moderate size.

Sub-fam: HARPINÆ.

Head and tentacles exposed; eyes conspicuous, developed. Mantle simple, enclosed, without a tapering appendage in front. Foot large, flat, not reflexed on the sides of the shell.

Operculum none.

Shell ventricose, whorls ribbed; inner lip simple anteriorly.

Genus HARPA, Rumphius.

Shell oval, ventricose; spire short, apex acute, whorls longitudinally ribbed, ribs ending posteriorly in sharp points; aperture oblong, large, emarginate anteriorly; outer lip thickened, forming the last rib.

Syn. Cithara, *Klein.* Harparia, *Rafin.* Harpalis, *Link.* Lyra, *Griff.*, not *Linn.*

Ex. H. minor, *Martini*, pl. 15, fig. 1. Shell, H. ventricosa, *Lamarck*, fig. 1, *a*.

The animals are variegated with beautiful colours, and crawl with vivacity; they have the singular power of spontaneously detaching a portion of the foot when molested, resembling, in this respect, *Haliotidea* and *Gena*. They are found in Ceylon, Mauritius, the Feejee Islands, and in Mexico. At Mauritius they are caught with lines baited with small pieces of flesh.

Species of Harpa.

cancellata, *Chem.*
costata, *Linn.*
crassa, *Phil.*
crenata, *Swains.*
gracilis, *Brod.*
major, *Mart.*
minor, *Mart.*
nablium, *Mart.*
nobilis, *Mart.*
rosacea, *Mart.*
striatula, *A. Adams.*
ventricosa, *Lam.*

Sub-fam. DACTYLINÆ.

Head and tentacles more or less concealed. Mantle with a tapering lobe in front, and an appendage behind which covers the spire, or reposes in the channelled suture.

Operculum wanting, or elongated and thin, with an apical, subspiral nucleus.

Shell solid, smooth; inner lip more or less plicate anteriorly.

Genus OLIVANCILLARIA, D'Orbigny.

Head and tentacles concealed. Mantle with a large, thick, fleshy appendage behind. Foot very voluminous,

truncate posteriorly, shield with the side-lobes very large and rounded.

Operculum distinct, half-ovate, nucleus subapical.

Shell smooth, oblong; spire short, suture not canaliculated to the apex; aperture moderate; columella with two or three oblique plaits anteriorly, and with a large callosity posteriorly.

Ex. O. vesica, *Gmelin*, pl. 15, fig. 2. Shell, O. vesica; fig. 2, *a*.

In this genus the suture of the spire is usually filled up with a callous deposit, and the spire is often very short. In the animal the hind part of the mantle ends in a large, thick, fleshy process, which partly covers the spire.

Species of Olivancillaria.

Braziliensis, *Chem.*

Sub-gen. UTRICULINA, Gray.

Spire acuminated, suture channelled as far as the apex; aperture moderate; last whorl simple.

acuminata, *Lam.*
ancillaroides, *Reeve.*
gibbosa, *Born.*
litterata, *Lam.*
ligneola, *Reeve.*
lutaria, *Bolt.*
nebulosa, *Lam.*

Sub-gen. LINTRICULA, H. and A. Adams (Scaphula, *Swainson*, not *Benson*).

Shell oblong, ventricose, thick; spire very short, obtuse, callous, suture not channelled to the apex; aperture very wide.

aquatilis, *Reeve.*
vesica, *Gmel.*

Genus AGARONIA, Gray.

Foot long and pointed behind, shield with the side-lobes moderate, acute.

Operculum distinct.

Shell oliviform, thin; spire acuminate, suture channelled; aperture wide, effuse anteriorly; columella not thickened posteriorly, tumid, with a few oblique plaits in front.

Syn. Hiatula, *Swains.*

Ex. A. megalostoma, *Meuschen*, pl. 15, fig. 3. Shell, A. megalostoma, fig. 3, *a*.

The animal of *Agaronia* differs from that of *Dactylus* in having an operculum, and from that of *Olivella* in the form of the side-lobes of the foot; the shell, moreover, is light, the spire long and pointed, and the aperture wide and effuse anteriorly.

Species of Agaronia.

cincta, *Reeve.*
contortuplicata, *Reeve.*
indusica, *Reeve.*
megalostoma, *Meusch.*
Steeriæ, *Reeve.*
striata, *Swains.*
testacea, *Lam.*

Genus DACTYLUS, Klein.

Tentacles enlarged at the base. Mantle with a posterior filament lodged in the channelled suture of the spire. Foot long and acuminate behind, shield with the side-lobes tapering, acute, small.

Operculum none.

Shell oblong, subcylindrical, polished; spire short, suture canaliculated; aperture long, narrow, notched in front; columella obliquely plicate, sulcated, or striated, with a callosity at the hind part; outer lip simple, rather thick.

Syn. Oliva, *Brug.* Ancillaria, *Risso*, not *Lam.* Olivaria, *Rafin.* Olivarius, *Dum.*

Ex. D. Mauritianus, *Martini*, pl. 15, fig. 4. Shell, D. Mauritianus, fig. 4, *a*.

The species of *Dactylus*, commonly known under the name of "Olives," are chiefly tropical in their geographical distribution. They live on sandy flats, and may be found by following the traces they leave by burrowing under the surface as the tide retires; they are very active, and glide with considerable quickness. In the genus, as restricted, the callus of the inner lip is produced posteriorly beyond the spire, and there is a prominent callosity on the anterior part of the last whorl.

Species of Dactylus.

avellana, *Lam.*
bulbiformis, *Duclos.*
bulbosus, *Bolt.*
inflatus, *Lam.*
tuberosus, *Bolt.*
undatus, *Lam.*

Sub-gen. STREPHONA, Browne.

Shell subcylindrical, polished; spire short, pointed, suture channelled as far as the apex; last whorl simple; columella obliquely plicate.

coniformis, *Phil.*
Cumingii, *Reeve.*
harpularius, *Lam.*
incrassatus, *Soland.*
ispidus, *Link.*
jaspideus, *Duclos.*

Julieta, *Duclos.*
marmoreus, *Mart.*
multiplicatus, *Reeve.*
olivaceus, *Meusch.*
pantherinus, *Phil.*
Peruvianus, *Lam.*
polpasta, *Duclos.*
porphyreus, *Linn.*
pygmæus, *Reeve.*
rufulus, *Duclos.*
splendidulus, *Sow.*
subangulatus, *Phil.*

Sub-gen. PORPHYRIA, Bolten.

Spire acuminate, suture canaliculate as far as the apex; body whorl simple; aperture narrow, linear; columella obliquely plicate.

elegans, *Lam.*
guttula, *Mart.*
irisans, *Lam.*
Labradorensis, *Bolt.*
Mauritianus, *Mart.*
mustelinus, *Lam.*
nobilis, *Reeve.*
Olympiadinus, *Duclos.*
ponderosus, *Duclos.*
porphyreticus, *Mart.*
scriptus, *Lam.*
sericeus, *Bolt.*
tremulinus, *Lam.*
viridescens, *Mart.*
Zeylanicus, *Lam.*

Sub-gen. ISPIDULA, Gray.

Spire elevated, suture channelled as far as the apex; last whorl simple; columella transversely strongly plicate as far as the hind part.

araneosus, *Lam.*
australis, *Duclos.*
cæruleus, *Bolt.*
emicator, *Meusch.*
ispidula, *Linn.*
kaleontinus, *Duclos.*
lentiginosus, *Reeve.*
modestus, *Reeve.*
panniculatus, *Duclos.*
paxillus, *Reeve.*
Stainforthii, *Reeve.*
venulatus, *Lam.*

Sub-gen. CYLINDRUS, Meuschen.

Spire entirely covered with a vitreous deposit, last whorl

cylindrical, with an angular ridge posteriorly; columella plicate as far as the hind part.

carneolus, *Lam.*
crassus, *Mart.*
pictus, *Reeve.*
tessellatus, *Lam.*
volvarioides, *Duclos.*

Genus OLIVELLA, Swainson.

Mantle with a large frontal lobe. Foot not very voluminous, truncate behind, shield narrow, side-lobes small, acute.

Operculum distinct, half-ovate, nucleus subapical.

Shell oliviform; spire produced, acute, suture canaliculated; aperture narrow behind, enlarged anteriorly; columella plicated in front, callous posteriorly.

Syn. Olivina, *D'Orbigny*, not *Mörch.*

Ex. O. Tehuelchana, *D'Orbigny*, pl. 15, fig. 5. Operculum, O. semistriata, *Gray*, fig. 5, *a*, 5, *b*. Shell, O. exigua, *Martini*, fig. 5, *c*.

The *Olivellæ* affect sandy localities, burying themselves in the sand, but leaving no trace behind. M. D'Orbigny observed *O. Tehuelchana*, while gliding rapidly along, suddenly expand the lobes of the foot and shoot through the water.

Species of Olivella.

anazora, *Duclos.*
attenuata, *Reeve.*
bullula, *Reeve.*
cyanea, *Reeve.*
dealbata, *Reeve.*
eburnea, *Lam.*
Esther, *Duclos.*
exigua, *Mart.*
fimbriata, *Reeve.*
fulgida, *Reeve.*
fulgurata, *Adams and Reeve.*
gracilis, *Brod. and Sow.*
Guildingii, *Reeve.*
hieroglyphica, *Reeve.*
inconspicua, *C. B. Adams.*
lanceolata, *Reeve.*

lineolata, *Gray.*
micans, *Soland.*
minuta, *Link.*
mitreola, *Duclos.*
monilifera, *Reeve.*
myriadina, *Duclos.*
nitidula, *Soland.*
oryza, *Lam.*
parvula, *Mart.*
pellucida, *Reeve.*
Puelchana, *D'Orb.*
pulchella, *Duclos.*
pura, *Reeve.*
purpurata, *Swains.*
rosolina, *Duclos.*
rufifasciata, *Reeve.*
strigata, *Reeve.*
Tehuelchana, *D'Orb.*
tergina, *Duclos.*
triticea, *Duclos.*
undatella, *Lam.*
zanoeta, *Duclos.*
zonalis, *Lam.*

Sub-gen. DACTYLIDIA, H. and A. Adams.

Spire obtuse, covered with a thick deposit of enamel; aperture narrow, plicate; inner lip with a large, thickened callus, produced at the hind part, and covering and concealing the spire.

millepunctata, *Duclos.*
mutica, *Say.*
nana, *Lam.*

Sub-gen. CALLIANAX, H. and A. Adams (Olivina, *Mörch*, not *D'Orb.*).

Shell not polished; spire produced, acute, suture channelled; aperture wide, effuse in front; callus of inner lip thick, defined; columella simple, or with a few plaits anteriorly.

biplicata, *Sow.*
columellaris, *Sow.*
semistriata, *Gray.*
zenopira, *Duclos.*

Sub-gen. LAMPRODOMA, Swainson.

Spire acuminate, elevated, suture canaliculated; inner lip simple posteriorly, regularly and closely plicate at the fore part of the columella; callus moderate, restricted.

leucozonias, *Gray.*
volutella, *Lam.*

Sub-fam. ANCILLINÆ,

Head concealed; eyes none; tentacles rudimentary. Mantle without a tapering lobe in front. Foot voluminous, bifid behind, shield grooved on the upper surface, side-lobes not much produced.

Operculum small, ovate, acute, sometimes entirely wanting.

Shell usually polished; whorls smooth; aperture effuse, with the front part of the columella variously grooved and twisted.

Genus DIPSACCUS, Klein.

Shell fusiformly cylindrical, polished, solid, generally deeply umbilicated; spire elevated, suture covered with enamel; aperture oval, elongated: inner lip tortuous; outer lip acute, with a slight tooth on the fore part.

Ex. D. glabratus, *Linnæus*, pl. 15, fig. 6.

In the *Dipsaccus* of Klein, as restricted, there are four species, distinguished by the deep umbilicus and channelled columella, which are owing to certain peculiarities of the animal not yet known. Lamarck included the *D. glabratus* among the species of his genus *Eburna*, which belongs to another group.

Species of Dipsaccus.

balteatus, *Sow.*
cingulatus, *Sow.*
glabratus, *Linn.*
niveus, *Swains.*

Sub-gen. AMALDA, H. and A. Adams.

Shell thin, not umbilicated; spire elongated, suture enamelled; inner lip with the callus moderate, defined; outer lip simple.

bicolor, *Gray.*
elongatus, *Gray.*
marginatus, *Lam.*
oblongus, *Sow.*
Tankervillianus, *Sow.*

Genus ANCILLA, Lamarck.

Shell oblong, subcylindrical, polished; spire short, suture filled up with enamel; aperture large, dilated, effuse anteriorly; columella callous anteriorly, twisted; outer lip thin, simple, acute.

Syn. Olivula, *Conrad.*

Ex. A. obtusa, *Swainson*, pl. 15, fig. 7. Operculum, A. obtusa, fig. 7, *a*, 7, *b*. Shell, A. torosa, *Meuschen*, fig. 7, *c*.

The *Ancillæ* inhabit submerged sand-banks, and progress with a swift gliding motion; sometimes they expand the large lobes of their foot in a horizontal direction, and swim or dart through the water. They chiefly inhabit the shores of Africa, though a few have been found in the Indian and Australian Seas.

Species of Ancilla.

albisulcata, *Sow.*
ampla, *Gmel.*
aperta, *Sow.*
Caffra, *Forsk.*
castanea, *Sow.*
effusa, *Swains.*
fulva, *Swains.*
lineata, *A. Adams.*
ventricosa, *Lam.*

Sub-gen. ANCILLARIA, Lamarck.

Shell thin, ventricose, striated; spire short, obtuse, suture enamelled; aperture wide.

alba, *Kien.*
torosa, *Meusch.*
volutella, *Desh.*

Sub-gen. ANAULAX, Roissy (Anolax, *Bron.*).

Shell not polished; spire produced, sutures covered with a thick deposit of enamel; inner lip with the callus extended, thick, and covering the spire.

australis, *Sow.*
mamillata, *Hinds.*
mucronata, *Sow.*
obtusa, *Hinds.*
rubiginosa, *Swains.*
subulata, *Reeve.*

Sub-gen. CHILOTYGMA, H. and A. Adams.

Spire moderate, suture enamelled; inner lip with the callus produced posteriorly into a strong angular tooth.

exigua, *Sow.*

Fam. FASCIOLARIIDÆ.

Teeth on lingual membrane in three series (1·1·1), the central recurved, toothed at the tip, the lateral not versatile; lateral teeth very broad, linear, with many equal teeth; central tooth narrow, small. Mantle enclosed, with a straight siphon.

The operculum in this family is ovate-acute, with the nucleus apical.

Shell fusiform; aperture with a straight canal in front, and with plaits on the fore part of the pillar.

Genus FASCIOLARIA, Lamarck.

Shell fusiform; spire acuminated; aperture oval, elongated, as long as the spire; siphonal canal straight; columella smooth, with a few oblique plaits at the fore part; outer lip internally crenate.

Syn. Pyrula, *Perry*, not *Lam.* Colus, *Bolten*, not *Humph.* Ieranea, *Rafin.*

Ex. F. lignaria, *Linnæus*, pl. 16, fig. 1. Operculum, F. tulipa, *Linnæus*, fig. 1, *a*, 1, *b*. Shell, F. tulipa, fig. 1, *c*.

The "Tulip Shells," as they have been called, are usually light and ventricose, and are known by their fusiform shape and by the few oblique plaits on the columella; they have a wide range in their distribution, being found in the Mediterranean, the Cape Verd Islands, Ceylon, the Philippines, the West Indies, Australia, Western Africa, and South America. The name of *Colus* is already in use as a synonym of *Fusus*.

Species of Fasciolaria.

Audouini, *Jonas.*
aurantiaca, *Lam.*
badia, *Krauss.*
clava, *Jonas.*
coronata, *Lam.*
crocata, *Phil.*
distans, *Lam.*
filamentosa, *Chem.*
fusiformis, *Valenc.*
gigantea, *Kien.*
granosa, *Brod.*
inermis, *Jonas.*
ligata, *Migh. and Adams.*
lignaria, *Linn.*
lugubris, *Adams and Reeve.*
papillosa, *Sow.*
ponderosa, *Jonas.*
princeps, *Sow.*
purpurea, *Jonas.*
Reevei, *Phil.*
salmo, *Wood.*
trapezium, *Linn.*
tulipa, *Linn.*

Genus BUSYCON, Bolten.

Shell pyriform, last whorl large, nodulous or spinose; spire very short; aperture large, subtriangular; canal open, elongated, entire at the fore part; inner lip concave, with a single fold anteriorly; outer lip internally striated.

Syn. Pyrula (part), *Lam.* Fulgur, *Montf.*

Ex. B. perversum, *Linnæus*, pl. 16, fig. 2.

Busycon has a reversed, light, ventricose shell, with a single plait on the fore part of the columella, and a sulcated outer lip; the species known are few, and come from tropical regions.

Species of Busycon.

affine, *Sow.*
aruanum, *Linn.*
canaliculatum, *Linn.*
crassicauda, *Phil.*
idoleum, *Jonas.*
Kieneri, *Phil.*
perversum, *Linn.*

Sub-gen. TAPHON, H. and A. Adams.

Shell dextral, transversely striated, whorls rounded; aperture ovate, fore part produced into a long, slightly-recurved canal.

striatum, *Gray.*

Genus TUDICLA, Bolten.

Shell fusiform; spire very short, apex papillary; aperture oval; canal very long and straight; columella smooth, flattened, with a single fold at the fore part.

Syn. Pyrella, *Swains.* Spirillus, *Schlut.*, not *Humph.* Spirilla, *Sow.*, *Jun.*

Ex. T. spirillus, *Linnæus*, pl. 16, fig. 3.

The papillary apex of the spire, the single plait on the columella, and the long straight beak, are the chief characteristics of this genus; the animal is not yet known; the shell appears to have the greatest affinity to *Busycon*, although usually regarded as a *Murex*.

Species of Tudicla.

porphyrostoma, *Adams and Reeve.*
rusticula, *Bast.*
spirillus, *Linn.*

Genus LATIRUS, Montfort.

Shell turreted, fusiform, umbilicated; spire produced, whorls nodulous; aperture oval-oblong; outer lip thin, crenulated; columella straight, with two or three small oblique plaits in front.

Syn. Polygona, *Schum.* Polygonum, *Blainv.*, not *Tournef.*

Ex. L. turritus, *Gmelin*, pl. 16, fig. 4. Operculum, L. turritus, fig 4, *a*, 4, *b*. Shell, L. gibbulus, *Gmelin*, fig. 4, *c*.

The animals of all the species of this genus which have been hitherto observed, are of a dull red colour; the shells resemble *Fusi*, but with the fore part of the pillar lip plicate.

Species of Latirus.

acuminatus, *Kien.*
afer, *Lam.*
ananas, *Chem.*
annulatus, *Bolt.*
aplustris, *Mart.*
attenuatus, *Reeve.*
brevicaudatus, *Reeve.*
castaneus, *Gray.*
ceratus, *Wood.*
concentricus, *Reeve.*
craticulatus, *Linn.*
fastigium, *Reeve.*
filamentosus, *Koch.*
filosus, *Schub. and Wag*
gibbulus, *Gmel.*
gracilis, *Reeve.*

lanceolatus, *Adams and Reeve.*
lautus, *Reeve.*
lyratus, *Reeve.*
nanus, *Reeve.*
nodatus, *Mart.*
recurvirostris, *Wag.*
rigidus, *Wood.*
rudis, *Reeve.*
sanguifluus, *Reeve.*
spadiceus, *Reeve.*
Stokesii, *Gray.*
turritus, *Gmel.*
varicosus, *Reeve.*
Zea, *Mörch.*

Sub-gen. PLICATELLA, Swainson (Cymatium, *Link*, not *Bolt.*).

Spire moderate, whorls angular, concavely depressed round the upper part.

Barclayi, *Reeve.*
candelabrum, *Reeve.*
cariniferus, *Lam.*
polygonus, *Linn.*
scolymus, *Gmel.*
Thersites, *Reeve.*

Genus PERISTERNIA, Mörch.

Shell subturreted, not umbilicated; whorls longitudinally ribbed; aperture oval; canal moderate and recurved; outer lip thin and crenulated; columella with one or two slight plaits anteriorly.

Ex. P. nassatula, *Lamarck*, pl. 16, fig. 5. Shell, P. nassatula, fig. 5, *a*.

This genus may be known from *Latirus*, which it closely approaches, by the folds on the pillar being less distinct, and by the canal being recurved.

Species of Peristernia.

Australiensis, *Reeve.*
bella, *Reeve.*
Caledonica, *Petit.*
cinerea, *Reeve.*
concinna, *Reeve.*
crenulata, *Reeve.*
crocea, *Gray.*
gemmata, *Reeve.*
incarnata, *Desh.*
maculata, *Reeve.*

nassatula, *Lam.*
nassoides, *Reeve.*
Philberti, *Ducl.*
prismatica, *Mart.*
pulchella, *Reeve.*
rosea, *Reeve.*
scabrosa, *Reeve.*
spinosa, *Mart.*
tuberculata, *Brod.*
ustulata, *Reeve.*
violacea, *Reeve.*

Genus LEUCOZONIA, Gray.

Shell oval, subglobose; spire moderate; aperture oblong; canal short; columella subflexuous, with small, oblique, unequal plaits; outer lip subacute, with a tooth or tubercle at the fore part.

Syn. Lagena, *Schum.*, not *Klein.*

Ex. L. smaragdulus, *Linnæus*, pl. 16, fig. 6. Operculum, L. cingulata, *Lamarck*, fig. 6, *a*, 6, *b*. Shell, L. cingulata, fig. 6, *c*.

Leucozonia resembles *Cancellaria* in its plaited columella, but a tooth or projection, more or less prominent, on the fore part of the outer lip, distinguishes it from that genus; a few of the species have, on this account, been confounded with *Acanthina*.

Species of Leucozonia.

angularis, *Reeve.*
Belcheri, *Adams and Reeve.*
Brasiliana, *D'Orb.*
Californica, *A. Adams.*
cingulata, *Lam.*
cingulifera, *Lam.*
crenulata, *Kien.*
fuscata, *Gmel.*
Knorii, *Desh.*
leucozonalis, *Lam.*
nassa, *Gmel.*
nigella, *Chem.*
picta, *Reeve.*
smaragdulus, *Linn.*
triserialis, *Lam.*

Genus FASTIGIELLA, Reeve.

Shell elongately turreted, umbilicated, whorls rounded; aperture small; canal very short; columella somewhat twisted.

Ex. F. carinata, *Reeve*, pl. 16, fig. 7.

In some respects this genus resembles *Turritella*, but it has a twisted columella; it also resembles those species of *Clavatula* with the canal short (*Drillia*, Gray), but the absence of sinus in the outer lip at once distinguishes it from them. At present, one recent species only is known.

Fam. VASIDÆ.

Teeth on lingual membrane in three series (1·1·1), the central recurved, toothed at the tip, the lateral not versatile; central tooth broad, few-toothed; lateral teeth narrow, strong, with a single large denticle. Mantle enclosed, with a straight siphon.

Operculum ovate, acute, with the nucleus apical.

Shell more or less turbinate, with plaits on the middle of the pillar.

This group appears to be intermediate between the "Tulip Shells" and the *Volutidæ*, and may be termed False Volutes; the lingual dentition and character of the animal are, however, entirely different from those of *Volutidæ*.

Genus VASUM, Bolten.

Shell oval, oblong, solid, tubercular or spinose; spire short; aperture oblong; canal short, somewhat recurved;

columella with several transverse folds in the middle; outer lip thickened and sinuous.

Syn. Cynodona, *Schum.* Clava, *Fabr.* Scolymus, *Swains.* Volutella, *Perry*, not *Swains.* or *D'Orb.*

Ex. V. cornigerum, *Linnæus*, pl. 17, fig. 1. Operculum, V. cornigerum, fig. 1, *a*, 1, *b*. Shell, V. cornigerum, fig. 1, *c*.

The animal is slow-moving, timid, and inactive, shrinking quickly within the shell on the slightest alarm; the operculum is very thick, claw-like, and partially free at the hind part. The species of this genus are not very numerous, and are confined to the tropics, being found in the East and West Indies and in the Pacific Islands.

Species of Vasum.

armatum, *Brod.*
cæstus, *Brod.*
capitellum, *Linn.*
cassidiforme, *Reeve.*
Ceramicum, *Linn.*
cornigerum, *Linn.*
globulus, *Reeve.*
imperiale, *Reeve.*
muricatum, *Born.*
rhinoceros, *Chem.*

Genus MAZZA, Klein.

Shell thick, obconic, smooth, last whorl large; spire obtuse, apex papillary; aperture oblong, narrow; canal long and straight; columella with several strong transverse plaits in the middle; outer lip thin, simple.

Syn. Xancus, *Bolten.* Rapum, *Humph.* Turbinellus, *Lam.*

Ex. M. pyrum, *Linnæus*, pl. 17, fig. 2.

The species of this genus are few in number, and the

animal which forms the shell has not yet been discovered; they are confined to very warm climates, inhabiting only the Philippines, the Galapagos, the West Indies, and the Pacific Islands.

Species of Mazza.

fusus, *Sow.*
ovoidea, *Kien.*
pyrum, *Linn.*
rapa, *Lam.*
scolymus, *Gmel.*

Fam. VOLUTIDÆ.

Teeth on lingual membrane in a single central series, often toothed. Head large, with the eyes sessile on the sides below the base of the tentacles; tentacles far apart, united by a broad veil over the head. Mantle sometimes greatly developed, covering the sides of the shell; siphon recurved, short, with auricles on each side of the base. Foot very large, partly hiding the shell.

Operculum none.

Shell with distinct plaits on the columella; apex of spire mamillated.

The family of Volutes comprises a suite of large shells remarkable for their great beauty and elegance of form. They are equatorial in their geographical distribution; as many as sixty-four species are natives of the Australian Seas, and about a dozen species are found in the great eastern ocean from Java to Japan; the coast of Africa and the shores of Madagascar harbour a few; some are from the east and west parts of South America; and about four inhabit the West Indies and the Gulf of Mexico.

Sub-fam. CYMBIINÆ.

Teeth lunate, apex three-toothed. Foot very large and thick. Shell ventricose.

The eyes are on the sides of the head at the outer base of the tentacles; the siphon is very short, and the foot is greatly extended and thickened; it deposits a layer of enamel on the under surface of the shell. Adanson found living young ones in the bodies of many *Cymbia*, thus proving them to be ovo-viviparous; the young ones leave their mother when their shells are an inch in length; there are four or five in each animal.

Genus CYMBIUM, Klein.

Shell oval-oblong, ventricose; spire short, nucleus large, globular, deciduous, when present forming an obtuse papillary apex; whorls few, forming a flat edge round the nucleus; aperture oblong, wide; columella with several oblique plaits; outer lip thin, simple.

Syn. Yetus, *Adanson.* Cymba, *Broderip.*

Ex. C. Persicum, *Martini*, pl. 17, fig. 3. Shell, C. Persicum, fig. 3, *a*.

Adanson observes that the high winds of April cast the "Yets" up in such vast quantities as sometimes to cover the shore; the natives of Senegal employ them as articles of diet. The species of this genus are principally inhabitants of the shores of Africa, though one is from Australia and another from the Mediterranean. As distinguished from *Melo*, the shells are uniform in colour, sombre, covered with an epidermis, and with a deci-

duous nucleus; the whorls, moreover, are never coronated as in that genus.

Species of Cymbium.

cymbium, *Linn.*
gracile, *Brod.*
mamilla, *Gray.*
olla, *Linn.*
patulum, *Brod.*
Persicum, *Mart.*
Philippinarum, *Mart.*
porcinum, *Lam.*
proboscidale, *Brod.*
rubiginosum, *Swains.*
Tritonis, *Brod.*

Genus MELO, Humphrey.

Shell large, subovate, ventricose; spire short, apex obtuse, papillary, persistent, whorls smooth, the last posteriorly coronated; aperture oblong, wide; columella with several oblique plaits, the anterior the largest; outer lip simple, acute, obliquely truncate in front.

Syn. Cymbium, *Montf.*, not *Klein.*

Ex. M. senticosa, *Bolten*, pl. 17, fig. 4. Shell, M. Æthiopica, *Lamarck*, fig. 4, *a.*

The animal of this genus appears to be ovo-viviparous, the same as the *Cymbium* of Klein, the young ones being arranged in the oviduct of the female in a long string, without egg-shells. The shells are usually ornamented with a variety of colours, and their whorls, posteriorly, are adorned with a diadem of spines; they are usually covered with a smooth, greenish-brown epidermis, and the nucleus is spiral and persistent. New Holland and the great islands of the Eastern Archipelago appear to be the countries in which the species of this genus are found, none of them having been observed in the New World.

Species of Melo.

Broderipii, *Gray.*
Æthiopica, *Linn.*
Indica, *Gmel.*
Miltonis, *Gray.*
mucronata, *Brod.*
nautica, *Lam.*
ramosa, *Meusch.*
senticosa, *Bolt.*
tessellata, *Lam.*
umbilicata, *Brod.*

Sub-gen. AUSOBA, H. and A. Adams.

Spire short, obtuse, apex papillary, last whorl coronated at the hind part; nucleus spiral.

cymbiola, *Chem.*

Genus AULICA, Gray.

Shell oblong-ovate, ventricose; spire with the apex papillary and surrounded by small tubercles, whorls smooth, usually nodose or coronated posteriorly; aperture oblong-linear; inner lip without any callous deposit; columella obliquely plicate, the plaits usually four; outer lip thin, simple.

Syn. Vespertilio, *Klein,* not *Linn.* Scapha, *Gray,* not *Klein* or *Humph.*

Ex. A. vespertilio, *Linnæus,* pl. 18, fig. 2. Shell, A. vespertilio, fig. 2, *a.*

In this genus the last whorl is usually spinose or tubercled, and the outer lip is thin and acute: the species are tolerably numerous, and are principally inhabitants of the East Indian Islands. As the shells increase in size the animals fill the nuclei of the spire with solid calcareous matter.

Species of Aulica.

aulica, *Soland.*
corona, *Chem.*
innexa, *Reeve.*
luteostoma, *Meusch.*
mamilla, *Meusch.*
marmorata, *Swains.*
Moltkiana, *Mart.*
nivosa, *Lam.*
Norrisii, *Sow.*
piperita, *Sow.*
pulchra, *Swains.*
punctata, *Swains.*
rutila, *Brod.*
scapha, *Gmel.*
Spengleriana, *Mart.*
vespertilio, *Linn.*

Sub-fam. ZIDONINÆ.

Eyes sessile, without tubercles. Mantle produced on the left side into an expanded lobe enveloping all the shell as far as the apex of the spire. Shell with the volutions of the spire covered with a vitreous deposit.

Genus ZIDONA, H. and A. Adams.

Shell smooth, subcylindrical, whorls angulated; spire pointed, polished, and covered with a calcareous deposit concealing the suture; aperture wide; columella obliquely plicate in the middle, plaits few; outer lip acute, not reflexed.

Syn. Volutella, *D'Orb.*, not *Perry* or *Swains.*

Ex. Z. angulata, *Solander*, pl. 17, fig. 5. Shell, Z. angulata, fig. 5, *a*.

The great peculiarity of *Zidona* is the circumstance of the mantle covering the sides of the shell, giving the long pointed spire a peculiar vitreous or glazed appear-

ance; the only species known is an inhabitant of the coasts of South America.

Sub-fam. VOLUTINÆ.

Teeth linear, with a single conical apex, the base angularly diverging. Mantle-margin included, not covering the sides of the shell.

Genus CALLIPARA, Gray.

Shell oblong-ovate, thin; spire short, obtuse, with the apex papillary, last whorl large, ventricose; columella with two distinct folds in front; outer lip extending up towards the spire posteriorly.

Ex. C. bullata, *Swainson*, pl. 17, fig. 6.

This curious genus, founded on the *Voluta bullata* of Swainson, is from Algoa Bay, South Africa; this, the only species known, is very rare, and is remarkable for its bullate aspect, its short rounded spire, and its nearly simple columella.

Genus CYMBIOLA, Swainson.

Shell ovate, cymbiform, thin; spire more or less produced, apex papillary, somewhat irregular; aperture wide; inner lip with a thin callus; columella with a few oblique plaits at the fore part; outer lip often somewhat dilated, acute.

Ex. C. Brasiliana, *Solander*, pl. 18, fig. 1. Shell, C. Magellanica, *Sowerby*, fig. 1, *a*.

In the animal of this group the basal lobes at the side of the siphon, peculiar to the genera of *Volutidæ*, appear to be well developed. According to M. D'Orbigny, the animal of *C. Brasiliana* forms nidimental capsules three inches in length.

Species of Cymbiola.

ancilla, *Soland.*
Beckii, *Brod.*
Brasiliana, *Soland.*
Ferussacii, *Donov.*
festiva, *Swains.*
magnifica, *Chem.*
Magellanica, *Sow.*

Genus SCAPHELLA, Swainson.

Shell oblong-cylindrical; spire short, conical, apex sub-acute, whorls solid, smooth; aperture narrow, elongate; columella usually with four oblique plaits at the fore part; outer lip thickened internally.

Ex. S. fusus, *Quoy and Gaimard,* pl. 18, fig. 3. Shell, S. Junonia, *Chemnitz,* fig. 3, *a.*

From the description and figure given by Swainson, it is obvious that the shells we have indicated constituted his genus *Scaphella*, although his first type belongs to our sub-genus *Alcithoe*, which has certain affinities with *Cymbiola.* The rare *S. Junonia* is said to be from the Gulf of Mexico.

Species of Scaphella.

exoptanda, *Sow.*
Junonia, *Chem.*
maculata, *Swains.*
prætexta, *Reeve.*

reticulata, *Reeve.*
Turneri, *Gray.*
undulata, *Lam.*
volva, *Chem.*
zebra, *Leach.*

Sub-gen. ALCITHOE, H. and A. Adams.

Shell ovately fusiform; spire produced, apex papillary; aperture ovate, wide; inner lip with a spreading callus; outer lip dilated, subreflexed.

fulgetrum, *Brod.*
fusiformis, *Swains.*
fusus, *Quoy and Gaim.*
gracilis, *Swains.*
megaspira, *Sow.*
Pacifica, *Soland.*
papillaris, *Swains.*
tuberculata, *Swains.*

Genus VOLUTA, Linnæus.

Shell ovate, sub-conical, solid; spire short, apex papillary, whorls nodose, the last longitudinally plicate; aperture oblong; columella straight, with a thick callus, transversely plicate, plaits numerous, the anterior the largest; outer lip thickened, somewhat reflected.

Syn. Lyra, *Linn.*, not *Griff.* Plejona, *Bolt.* Musica, *Humph.*

Ex. V. musica, *Linnæus*, pl. 18, fig. 4.

In this genus the species are ornamented with transverse interrupted bands and striæ; the shells are dense, and the plaits on the columella are numerous and well developed. Dr. Gray states it to possess a moderately-sized operculum.

Species of Voluta.

hebræa, *Linn.*
musica, *Linn.*
musicalis, *Mart.*

Genus HARPULA, Swainson.

Shell ovate-conic, solid, smooth or sub-nodulous; spire conical, produced, with a small, pointed, papillary apex; aperture long, wider anteriorly; columella with numerous oblique plaits, the anterior the largest; outer lip acute, thickened internally.

Ex. H. vexillum, *Martini*, pl. 18, fig. 5.

The species of this genus, usually known under the name of "Flag Volutes," are smooth, solid shells, handsomely ornamented with transverse coloured bands and rows of spots; the apex of the spire is rather acute, and the plaits on the columella are obliquely disposed.

Species of Harpula.

Lapponica, *Linn.*
vexillum, *Mart.*

Genus FULGURARIA, Schumacher.

Shell oblong, fusiform; spire acuminated, apex large, smooth, papillary, whorls longitudinally plicate and transversely striated, the last anteriorly contracted and acuminated; aperture elongated; columella sharp anteriorly, with from six to ten oblique plaits, the middle plaits

the largest; outer lip thickened, with the margin more or less crenate.

Ex. F. fulgura, *Martini*, pl. 18, fig. 6.

Most of the genera of Volutes have smooth shells; in *Fulguraria*, however, an example occurs where the whorls are transversely striated throughout; the outer lip is somewhat effuse, with the fore part slightly toothed or crenate.

Species of Fulguraria.

concinna, *Brod.* fulgura, *Mart.*

Sub-gen. AURINIA, H. and A. Adams.

Shell ovately fusiform; spire with the apex mamillated, whorls transversely finely striated, longitudinally subplicate; columella with the folds obsolete; outer lip thin, simple.

dubia, *Brod.*

Genus LYRIA, Gray.

Shell ovately fusiform, solid; spire acuminate, whorls longitudinally ribbed; aperture ovate; columella with numerous transverse plaits; outer lip simple, acute.

Ex. L. nucleus, *Lamarck*, pl. 18, fig. 7.

This genus is composed of elegant mitriform shells, with the whorls longitudinally ribbed, and with numerous small plaits on the columella. Some of the species are from Australia, while others are from the West Indies.

Species of Lyria.

cassidula, *Reeve.*
Delessertiana, *Petit.*
lyrata, *Humph.*
lyræformis, *Swains.*
mitriformis, *Lam.*
nucleus, *Lam.*

Sub-gen. ENÆTA, H. and A. Adams.

Shell ovately pyramidal, thick, solid; spire acuminated, apex acute, whorls ribbed or nodulose; outer lip thickened, inflexed, with an obtuse tooth in the middle.

Cumingii, *Brod.*
cylleniformis, *Sow.*
Guildingii, *Sow.*
guttata, *Reeve.*
harpa, *Barnes*

Genus VOLUTILITHES, Swainson.

Shell ovately fusiform; spire elevated, apex acute, whorls longitudinally plicate or cancellated; aperture oval-oblong; columella with numerous faint, rudimentary or obsolete plaits; outer lip thin, simple.

Ex. V. abyssicola, *Adams and Reeve*, pl. 18, fig. 8.

The only living representative of this genus at present known was dredged from a depth of one hundred and thirty-two fathoms off the Cape of Good Hope, during the voyage of H.M.S. Samarang; fossil species are numerous in the eocine portion of the tertiary beds of the British Isles.

Fam. MITRIDÆ.

Head small and narrow; tentacles close together at the base; eyes above the base or towards the outer middle

of the tentacles. Mantle enclosed, siphon simple at the base. Foot small and triangular.

Operculum none or rudimentary.

Shell with the columella more or less plicate; apex of spire acute.

Some of the larger species of *Mitridæ* have no operculum, but it is often present, though small, on the foot of the smaller species. The Philippine Archipelago, and other groups of islands, seem principally to harbour these animals, few species being found on the shores of continents.

Sub-fam. MITRINÆ.

Head moderate; eyes usually near the outer middle or tip of the tentacles; foot truncate in front. Shell for the most part destitute of epidermis; columella distinctly plicate.

Genus MITRA, Lamarck.

Shell fusiform, thick; spire elevated, acute at the apex; aperture small, narrow, notched in front; columella obliquely plicate; outer lip thickened, smooth internally.

Syn. Thiarella, *Swains.* Mitraria, *Rafin.* Mitrolites, *Krug.*

Ex. M. circulata, *Kiener*, pl. 19, fig. 1. Shell, M. episcopalis, *Linnæus*, fig. 1, *a*.

When irritated, some species of *Mitra* emit a purple fluid having a nauseous odour. They are chiefly deep-water animals, living in from fifteen to eighty fathoms; the greater number are from the Philippines; some, how-

ever, are from Australia, West Africa, and the Indian Ocean. The teeth of this group have been ascertained by Dr. Gray to resemble those of *Fasciolaria*, the central tooth being narrow and small, and the lateral teeth broad, linear, and multidentate.

Species of Mitra.

ægra, *Reeve.*
Bovei, *Kien.*
chalybeia, *Reeve.*
cancellata, *Reeve.*
cardinalis, *Meusch.*
Chinensis, *Gray.*
cincta, *Meusch.*
cylindracea, *Reeve.*
episcopalis, *Linn.*
floccata, *Reeve.*
fulgurita, *Reeve.*
granulosa, *Lam.*
guttata, *Swains.*
Lamarckii, *Desh.*
lens, *Wood.*
lignaria, *Reeve.*
lugubris, *Reeve.*
muriculata, *Lam.*
nebulosa, *Reeve.*
nigra, *Reeve.*
nivea, *Reeve.*
Norrisii, *Reeve.*
nympha, *Reeve.*
orientalis, *Gray.*
papalis, *Lihn.*
pigra, *A. Adams.*
propinqua, *A. Adams.*
puncticulata, *Lam.*
Rossiæ, *Reeve.*
rupicola, *Reeve.*
sacerdotalis, *A. Adams.*
Santangeli, *Maragv.*
solida, *Reeve.*
Swainsonii, *Brod.*
tessellata, *Martyn.*
variabilis, *Reeve.*
versicolor, *Martyn.*

Sub-gen. NEBULARIA, Swainson.

Shell impressed with transverse grooves, last whorl anteriorly contracted; aperture narrow behind, effuse in front; outer lip with the margin smooth.

adusta, *Mart.*
ambigua, *Swains.*
badia, *Reeve.*
Barbadensis, *Gmel.*
buccinata, *Quoy*
brumalis, *Reeve.*

cephina, *Gould.*
castanea, *A. Adams.*
cæligena, *Reeve.*
chrysostoma, *Swains.*
coronata, *Chem.*
crassa, *Swains.*
crebralis, *Lam.*
crenilabris, *A. Adams.*
dealbata, *A. Adams.*
declivis, *Reeve.*
digitalis, *Reeve.*
granata, *Reeve.*
impressa, *Anton.*
nebulosa, *Swains.*
obscura, *Humph.*
pellis-serpentis, *Reeve.*
rhodia, *Reeve.*
rutila, *A. Adams.*
serotina, *A. Adams.*
suturata, *Reeve.*
Ticaonica, *Reeve.*
ustulata, *Reeve.*
vexillum, *Reeve.*
vitellina, *Gould.*

Sub-gen. SCABRICOLA, Swainson.

Shell rough, with transverse, elevated ridges and longitudinal striæ; suture not coronated; aperture effuse; outer lip crenate.

asperulata, *A. Adams.*
cærulea, *Reeve.*
clathrus, *Gmel.*
cratitia, *A. Adams.*
formosa, *A. Adams.*
gracilis, *Reeve.*
granatina, *Lam.*
granulosa, *Brug.*
hebes, *Reeve.*
inquinata, *Reeve.*
lacunosa, *Reeve.*
latruncularia, *Reeve.*
leucostoma, *Swains.*
limata, *Reeve.*
loricata, *Reeve.*
luctuosa, *A. Adams.*
Marquesina, *A. Adams.*
picta, *Reeve.*
pretiosa, *Reeve.*
rorata, *Gould.*
rubiginosa, *Reeve.*
scabricula, *Linn.*
serpentina, *Lam.*
sphærulata, *Martyn.*
suturata, *Reeve.*
texturata, *Lam.*
variegata, *Reeve.*

Sub-gen. CANCILLA, Swainson.

Shell fusiform, slender; spire acuminate, whorls crossed by transverse, linear, elevated ridges; aperture simple posteriorly; outer lip thin, simple.

amœna, *A. Adams.*
annulata, *Reeve.*

attenuata, *Reeve.*
avenacea, *Reeve.*
Belcheri, *Hinds.*
carnicolor, *Reeve.*
cingulata, *A. Adams.*
circulata, *Kien.*
duplilirata, *Reeve.*
filaris, *Linn.*
flammea, *Quoy.*
flammigera, *Reeve.*
funiculata, *Reeve.*
gigantea, *Swains.*
Hindsii, *Reeve.*
incarnata, *Reeve.*
insculpta, *A. Adams.*
interlirata, *Reeve.*
Isabella, *Swains.*
lineata, *Swains.*
multilirata, *A. Adams.*
nitens, *Kien.*
Philippinarum, *A. Adams.*
pura, *A. Adams.*
reticulata, *A. Adams.*
rosacea, *Reeve.*
rufescens, *A. Adams.*
rufilirata, *Adams and Reeve.*
Solandri, *Reeve.*
sulcata, *Swains.*
straminea, *A. Adams.*
tornata, *Reeve.*
verrucosa, *Reeve.*

Sub-gen. CHRYSAME, H. and A. Adams.

Shell ovate; spire as long as the aperture, whorls with transverse, elevated ribs; inner lip with a few strong transverse plaits; outer lip with the margin crenate.

aurantiaca, *Chem.*
clandestina, *Reeve.*
coronata, *Lam.*
cucumerina, *Lam.*
eximia, *A. Adams.*
fragra, *Quoy and Gaim.*
globosa, *Chem.*
læta, *A. Adams.*
peregra, *Reeve.*
Peronii, *Lam.*
planilirata, *Reeve.*
procissa, *Reeve.*
roborea, *Reeve.*
rotundilirata, *Reeve.*
tiarella, *A. Adams.*
Rüppellii, *Reeve.*
tabanula, *Lam.*
telescopium, *Reeve.*
tornatelloides, *Reeve.*
turgida, *Reeve.*

Sub-gen, ISARA, H. and A. Adams.

Shell thin, subulate; spire much longer than the aperture,

whorls simple; aperture dilated; inner lip with a produced, defined callus; outer lip thin, smooth within, effuse anteriorly.

bulimoides, *Reeve*.
picta, *Reeve*.
Schroeteri, *Desh*.

Sub-gen. MUTYCA, H. and A. Adams.

Shell subulate, thin; spire much longer than the aperture, whorls finely striated; aperture effuse anteriorly; outer lip thin, simple.

ancilloides, *Swains*.
bellula, *A. Adams*.

Sub-gen. AIDONE, H. and A. Adams.

Shell fusiform, smooth, polished; spire acuminate, as long as the aperture; inner lip excavated, with two obtuse plaits in the middle; outer lip thin, simple.

insignis, *A. Adams*.

Genus VOLUTOMITRA, Gray.

Shell ovate or fusiform, smooth, covered with an epidermis, whorls simple; columella with oblique plaits; outer lip thin, simple, arcuated.

Ex. V. Grœnlandica, *Gray*, pl. 19, fig. 2.

Dr. Gray has examined the teeth of this genus, and finds them to resemble those of *Scaphella Turneri* among the Volutidæ, having a single conical apex and bifurcate base.

Species of Volutomitra.

Adansonii, *Kien.*
capillata, *Gould.*
Chilensis, *Gray.*
cornea, *Lam.*
cornicula, *Lam.*
cornicularis, *Lam.*
ebenus, *Lam.*
Graja, *Reeve.*
Grœnlandica, *Gray.*
lactea, *Lam.*
lutescens, *Lam.*
melaleuca, *Quoy.*
melaniana, *Lam.*
nigra, *Quoy.*
oleacea, *Reeve.*
Quoyii, *Desh.*
Philippiani, *Forbes.*
plumbea, *Lam.*
semen, *Reeve.*
simplex, *Dkr.*
strigata, *Swains.*
tigrina, *A. Adams.*

Genus STRIGATELLA, Swainson.

Shell ovate or fusiform, solid; spire acuminate, whorls smooth or transversely striated, usually covered with an epidermis; aperture narrow; columella transversely plicate; inner lip with a callosity at the hind part; outer lip usually thickened in the middle, and internally grooved or dentate.

Ex. S. Woldemarii, *Kiener*, pl. 19, fig. 3. Shell, S. Ziervogeliana, *Chemnitz*, fig. 3, *a*.

The species of this genus are remarkable for their Columbelliform appearance, and are usually found under stones at low water, sometimes also in the crevices of rocks, and on the borders of shallow pools left by the retiring tide. In the typical species the whorls are usually striped and covered with a thick epidermis; in the sub-genus *Mitreola*, founded by Swainson on a fossil species, but which appears to us to include many recent forms, the apex is more acuminated, and the whorls are

uniform in colour and transversely striated; the *Zierlianæ* have the outer lip inflexed and crenulated.

Species of Strigatella.

amphorella, *Lam.*
auriculoides, *Reeve.*
chelonia, *Reeve.*
chrysalis, *Reeve.*
columbellæformis, *Kien.*
decurtata, *Reeve.*
dichroma, *A. Adams.*
granum, *Forbes.*
labratula, *Lam.*
lineata, *Swains.*
littoralis, *Forbes.*
litterata, *Lam.*
lutea, *Quoy.*
maculosa, *Reeve.*
millecostata, *Brod.*
mutelina, *Duclos.*
nitida, *A. Adams.*
paupercula, *Lam.*
pediculus, *Lam.*
pica, *Reeve.*
patula, *Reeve.*
nanus, *Reeve.*
retusa, *Lam.*
scutulata, *Chem.*
semicostata, *Lam.*
tristis, *Swains.*
unifascialis, *Lam.*

Sub-gen. MITREOLA, Swainson.

Shell ovato-fusiform, solid, smooth or transversely striated; spire acuminated, apex sometimes papillary; columella with the middle plaits the largest; outer lip gibbose internally in the middle.

abbatis, *Chem.*
albina, *A. Adams.*
acuminata, *Swains.*
astricta, *Reeve.*
caliginosa, *Reeve.*
callosa, *Desh.*
coarctata, *Swains.*
effusa, *Swains.*
fastigium, *Reeve.*
fulva, *Swains.*
ignobilis, *Reeve.*
limbifera, *Lam.*
nigra, *Reeve.*
testacea, *Swains.*

Sub-gen. ZIERLIANA, Gray.

Shell ovate, solid; spire short, acute, last whorl tumid at the hind part; columella with a callosity posteriorly; outer lip thick, flattened, sinuated at the hind part, lirato-dentate internally.

alveolus, *Reeve.*
anthracina, *Reeve.*
Æthiops, *Reeve.*
bilineata, *Reeve.*
choava, *Reeve.*
creniplicata, *A. Adams.*
livida, *Reeve.*
robusta, *Reeve.*
solidula, *Reeve.*
virgata, *Reeve.*
Woldemarii, *Kien.*
Ziervogeliana, *Chem.*

Genus TURRICULA, Klein.

Shell elongated, turreted, longitudinally ribbed or plicate; spire acuminated; aperture narrow; columella with numerous plaits; outer lip internally striated.

Syn. Vexillum, *Bolt.* Turris, *Montf.*, not *Humph.* Tiara, *Swains.*, not *Bolt.* Vulpecula, *Gray.*

Ex. T. corrugata, *Lamarck*, pl. 19, fig. 4. Shell, T. vulpecula, *Lamarck*, fig. 4, *a.*

Turricula differs from *Mitra* in being longitudinally ribbed, and in the outer lip being striated within. The species live in exposed situations on the reefs, or crawl about the clear coral-sands in shallow bays and inlets. In this group the teeth, as shown by Dr. Gray, most resemble those of the *Muricidæ*, the lateral teeth being flat, with a bent-up process at the end more or less at right angles with the base.

Species of Turricula.

attenuata, *Brod.*
aurantia, *Brod.*
balteolata, *Reeve.*
Caffra, *Linn.*
cinctella, *Lam.*
coccinea, *Reeve.*
corrugata, *Kien.*
costellaris, *Lam.*
crenata, *Brod.*
Defrancii, *Payr.*
Denisoni, *Reeve.*
foraminata, *Swains.*
formosa, *A. Adams.*
forticostata, *Reeve.*
funerea, *Reeve.*
Gruneri, *Reeve.*
intermedia, *Kien.*
interrupta, *A. Adams.*
Jukesii, *A. Adams.*
ligata, *A. Adams.*
lineata, *Brod.*
lyrata, *Lam.*
melongena, *Lam.*
multicostata, *Brod.*
nivea, *Brod.*
ornata, *A. Adams.*
plicata, *Klein.*
pullata, *Reeve.*
Regina, *Chem.*
rugosa, *Gmel.*
semiplicata, *Lam.*
tæniata, *Lam.*
terebralis, *Brod.*
tumida, *Reeve.*
virgo, *Linn.*
vittata, *Swains.*
vulpecula, *Linn.*
zonalis, *Quoy and Gaim.*

Sub-gen. COSTELLARIA, Swainson.

Shell with the last whorl contracted anteriorly, slightly ventricose in the middle; whorls convex, ribs extending as far as the suture; spire longer than the aperture; aperture striated internally.

alauda, *Soland.*
amanda, *Reeve.*
angulosa, *Kust.*
arenaria, *Lam.*
arenosa, *Lam.*
armigera, *Reeve.*
armillata, *Reeve.*
articulata, *Reeve.*
australis, *Swains.*
cadaverosa, *Reeve.*
cælata, *Reeve.*
candida, *Reeve.*
catenata, *Reeve.*
cithara, *Reeve.*
clathrata, *Reeve.*
compta, *A. Adams.*
concentrica, *Reeve.*
corallina, *Reeve.*

cruentata, *Chem.*
decora, *Reeve.*
dædala, *Reeve.*
delicata, *A. Adams.*
Deshayesii, *Reeve.*
discoloria, *Reeve.*
echinata, *A. Adams.*
elegans, *Reeve.*
exarata, *A. Adams.*
exasperata, *Chem.*
festa, *Reeve.*
fusiformis, *Kien.*
gausapata, *Reeve.*
gratiosa, *Reeve.*
inermis, *Reeve.*
infausta, *Reeve.*
lubens, *Reeve.*
lucida, *Reeve.*
marmorea, *A. Adams.*
microzonias, *Lam.*
militaris, *Reeve.*
mirabilis, *A. Adams.*
modesta, *Reeve.*
mucronata, *Swains.*
nodilyrata, *A. Adams.*
oniscia, *Lam.*
Pacifica, *Reeve.*
pallida, *A. Adams.*
pruinosa, *Reeve.*
pulchella, *Reeve.*
purpurata, *Reeve.*
pusilla, *A. Adams.*
radius, *Reeve.*
rigida, *Swains.*
rubella, *Adams and Reeve.*
rufocincta, *A. Adams.*
rustica, *Reeve.*
scitula, *A. Adams.*
sculptilis, *Reeve.*
semifasciata, *Lam.*
semisculpta, *Adams and Reeve.*
solitaria, *C. B. Adams.*
spicata, *Reeve.*
Suluensis, *Adams and Reeve.*
torulosa, *Kien.*
turricula, *A. Adams.*
turriger, *Reeve.*
vibex, *A. Adams.*
zelotypa, *Reeve.*

Sub-gen. PUSIA, Swainson.

Shell ovate, more or less longitudinally ribbed or nodulous; spire often thick, obtuse; outer lip thickened, often reflected.

Adamsonii, *Gray.*
affinis, *Reeve.*
alveolata, *Reeve.*
amabilis, *Reeve.*
analogica, *Reeve.*
aureolata, *Reeve.*
Capensis, *Dkr.*
cavea, *Reeve.*
cimelium, *Reeve.*
cinerea, *Reeve.*
concinna, *Reeve.*
consanguinea, *Reeve.*
coriacea, *Reeve.*
crocata, *Reeve.*
crocea, *Reeve.*
Cumingii, *Reeve.*
dermestina, *Lam.*
dichroa, *Adams and Reeve.*

encausta, *Gould.*
ficulina, *Lam.*
fidicula, *Gould.*
flavescens, *Reeve.*
glandiformis, *Reeve.*
histrio, *Reeve.*
lachryma, *Reeve.*
lauta, *Reeve.*
leucodesma, *Reeve.*
lota, *Reeve.*
luculenta, *Reeve.*
mica, *Reeve.*
muriculata, *Lam.*
nodosa, *Swains.*
nodulifera, *A. Adams.*
nucleola, *Lam.*
pardalis, *Kust.*
patriarchialis, *Chem.*
pinguis, *Reeve.*
porphyretica, *Reeve.*
puella, *Reeve.*
pyramidalis, *Reeve.*
rosea, *Brod.*
rubra, *Brod.*
Savignii, *Payr.*
semiferruginea, *Jonas.*
speciosa, *Reeve.*
tuberosa, *Reeve.*
turben, *Reeve.*
tusa, *Reeve.*
variata, *Reeve.*
venustula, *Reeve.*

Sub-gen. CALLITHEA, Swainson.

Shell with longitudinal, linear ribs crossed with transverse bands and striæ, last whorl narrowed anteriorly; spire nearly equal in length to the aperture; aperture with the internal channel nearly obsolete.

acuminata, *Chem.*
acupicta, *Reeve.*
crebrilirata, *Reeve.*
Hainillei, *Petit.*
macrospira, *A. Adams.*
obeliscus, *Reeve.*
polita, *Reeve.*
rubricata, *Reeve.*
sanguisuga, *Linn.*
Stainforthii, *Reeve.*
subulata, *Lam.*
Zebuensis, *Reeve.*

Sub-gen. THALA, H. and A. Adams.

Shell fusiform, cancellated; spire as long as the aperture, last whorl attenuated, recurved; outer lip straight in the middle, thickened, lirate internally, and with a slight sinus at the hind part.

exilis, *Reeve.*
gratiosa, *Reeve.*
milium, *Reeve.*
mirifica, *Reeve.*
recurva, *Reeve.*

Sub-gen. ZIBA, H. and A. Adams.

Spire acuminate, whorls smooth, subnodose or keeled; inner lip with the callus defined; outer lip sometimes thickened in the middle.

apicata, *Reeve.*
carinata, *Swains.*
micans, *Reeve.*
peculiaris, *Reeve.*
Senegalensis, *Reeve.*
typha, *Reeve.*

Genus CYLINDRA, Schumacher.

Shell oliviform, subcylindrical; spire elevated, conical; aperture linear; columella straight, with several oblique plaits anteriorly; outer lip thickened, crenulated.

Ex. C. nucea, *Meuschen*, pl. 19, fig. 5. Shell, C. crenulata, *Lamarck*, fig. 5, *a.*

There is no operculum on the foot of the animal, which in every essential resembles that of *Mitra:* the species are principally found crawling on sandy patches among coral reefs, inside the barrier.

Species of Cylindra.

crenulata, *Lam.*
dactylus, *Linn.*
fenestrata, *Lam.*
glans, *Reeve.*
nucea, *Meusch.*
obesa, *Reeve.*
ornata, *Schub.*
punctata, *Swains.*
Sinensis, *Reeve.*
undulosa, *Reeve.*
vultuosa, *Reeve.*

Sub-gen. SWAINSONIA, H. and A. Adams (Mitrella, *Swains.*, not *Risso*).

Shell oliviform, smooth, polished, sometimes covered with an epidermis, last whorl anteriorly obtuse, expanded; spire nearly or quite equal to the aperture; columella with a few oblique plaits; outer lip smooth internally.

bicolor, *Swains.*
casta, *Swains.*
filum, *Wood.*
fissurata, *Lam.*
fusca, *Swains.*
incisa, *Adams and Reeve.*
lævis, *A. Adams.*
Mariæ, *A. Adams.*
ocellata, *Swains.*
zephyra, *Recluz.*
zonata, *Marryatt.*

Genus IMBRICARIA, Schumacher.

Shell coniform, often covered with an epidermis; spire depressed, apex mucronate; aperture linear; columella straight, with numerous transverse imbricate plates in the middle; outer lip thickened and sometimes crenulate.

Syn. Conohelix, *Swains.*

Ex. I. olivæformis, *Swainson*, pl. 19, fig. 6. Shell, I. conus, *Chemnitz*, fig. 6, *a*.

The species of this genus have much the same habits as those of *Cylindra*, being found chiefly in sandy spots among coral reefs; those with an epidermis, as *I. conus*, have been found buried in black mud in Mangrove swamps by one of the authors.

Species of Imbricaria.

bacillum, *Lam.*
carbonaria, *Hinds.*
citrina, *Reeve.*
conica, *Schum.*

conus, *Chem.*
muricata, *Brod.*
olivæformis, *Swains.*
ossea, *Reeve.*
truncata, *Kien.*
Vanikorensis, *Quoy and Gaim.*
virgo, *Swains.*

Sub-fam. COLUMBELLINÆ.

Head elongated; eyes near the outer bases of the tentacles; foot anteriorly produced. Shell usually covered with an epidermis; inner lip anteriorly toothed or tubercled; outer lip gibbous in the middle or at the hind part.

The lingual dentition of this sub-family seems to resemble that of the *Muricidæ* and *Buccinidæ*, with which families it should, perhaps, be united.

Genus COLUMBELLA, Lamarck.

Shell ovate-oblong, triangular or fusiform; spire acute at the apex; aperture long, narrow, contracted in the middle; inner lip curved, crenulated or denticulated; outer lip dentate, gibbous, thickened in the middle.

Syn. Columbus, *Montf.* Peristera, *Rafin.*

Ex. C. fulgurans, *Lamarck*, pl. 19, fig. 7. C. (Mitrella) sertularia, *D'Orbigny*, fig. 7, *a.* Operculum, C. fulgurans, fig. 7, *b*, 7, *c.* Shell, C. mercatoria, *Linnæus*, fig. 7, *d.*

The species of *Columbella* are pretty little variegated shells, and very numerous. The animal resembles that of *Mitra*, and is found in the same localities as the species of *Strigatella*, crawling on the surface of sand-flats in shallow water, or living on stony beaches, where they sometimes congregate about and under stones in

considerable numbers. They are widely distributed, being inhabitants of the East and West Indies, South America, California, Australia, and the Mediterranean.

Species of Columbella.

ambigua, *Kien.*
anacteola, *Ducl.*
azora, *Ducl.*
bidentata, *Mke.*
Bovinii, *Kien.*
castanea, *Sow.*
conspicua, *C. B. Adams.*
cornea, *Kien.*
coronata, *Ducl.*
fabula, *Sow.*
fasciata, *Sow.*
festiva, *Kien.*
formosa, *Gask.*
fulgurans, *Lam.*
fustigata, *Kien.*
hæmastoma, *Sow.*
harpæformis, *Sow.*
labiosa, *Sow.*
lentiginosa, *Hinds.*
luteola, *Kien.*
major, *Sow.*
meleagris, *Ducl.*
mercatoria, *Linn.*
modesta, *Kien.*
nucleus, *Kien.*
ocellata, *Link.*
Paytensis, *Less.*
pardalina, *Lam.*
phasinola, *Ducl.*
Pleei, *Kien.*
pulchella, *Kien.*
rasolia, *Ducl.*
reticulata, *Lam.*
rustica, *Linn.*
scripta, *Lam.*
spongiarum, *Ducl.*
strombiformis, *Lam.*
tessellata, *C. B. Adams.*
tumida, *Ducl.*
turturina, *Lam.*
Tyleri, *Gray.*
uncinata, *Sow.*
uvania, *Ducl.*
varians, *Sow.*
vulpecula, *Sow.*
xiphitella, *Ducl.*
Yoldina, *Ducl.*

Sub-gen. NITIDELLA, Swainson.

Shell ovate, smooth; columella with one or two slight folds at the fore part; outer lip slightly thickened and inflexed.

baccata, *Gask.*
Broderipii, *Sow.*
cerealis, *Mke.*
dichroa, *Sow.*

Kraussii, *Sow.*
lævigata, *Linn.*
leucostoma, *Gask.*
mitrula, *Dkr*
nitida, *Lam.*
parvula, *Dkr.*
pulchrior, *C. B. Adams.*
pusilla, *Sow.*

Sub-gen. ALIA, H. and A. Adams.

Shell thin, smooth, covered with an epidermis; spire moderate; aperture ovate; inner lip finely crenate; outer lip with the margin thickened, not callous in the middle, lirate internally.

carinata, *Hinds.*
castanea, *Gould.*
gausapata, *Gould.*
Hindsii, *Gask.*
unicolor, *Sow.*
unifasciata, *Sow.*

Sub-gen. MITRELLA, Risso (not *Swains.*).

Shell fusiform; spire elevated, acute, whorls smooth; columella simple, or with a few tubercles anteriorly; outer lip simple or crenate within.

achatina, *Sow.*
adiastina, *Ducl.*
albina, *Kien.*
austrina, *Gask.*
buccinoides, *Sow.*
Californiana, *Gask.*
chrisopis, *Ducl.*
cribraria, *Lam.*
Crossiana, *Recluz.*
denticulata, *Sow.*
flexuosa, *Brug.*
Gervillii, *Payr.*
idalina, *Ducl.*
impolita, *Sow.*
intexta, *Gask.*
lactea, *Ducl.*
ligula, *Ducl.*
lutea, *Quoy.*
nympha, *Ducl.*
pulla, *Gask.*
scripta, *Linn.*
semiconvexa, *Lam.*
sertularia, *D'Orb.*
tamelina, *Ducl.*
Ticaonis, *Sow.*
valveta, *Ducl.*
zebra, *Gray.*

Sub-gen. ATILIA, H. and A. Adams.

Shell fusiform; spire elevated, acute, whorls longitudinally plicate, the body-whorl abruptly constricted at the fore part; outer lip straight, contracted anteriorly.

conspersa, *Gask.*
contaminata, *Gask.*
exilis, *Phil.*
gracilis, *C. B. Adams.*
jaspidea, *Sow.*
puella, *Sow.*
suffusa, *Sow.*

Sub-gen. ANACHIS, H. and A. Adams.

Shell ovately-fusiform; spire elevated, whorls longitudinally ribbed; aperture narrow; columella straight; outer lip somewhat rectilinear, crenate internally.

acleonta, *Ducl.*
atomella, *Ducl.*
atramentaria, *Sow.*
azora, *Ducl.*
catenata, *Sow.*
cancellata, *Gask.*
costellata, *Sow.*
costulata, *C. B. Adams.*
decussata, *Sow.*
diminuta, *C. B. Adams.*
decipiens, *C. B. Adams.*
electona, *Ducl.*
fluctuata, *Sow.*
fulva, *Sow.*
Guildingii, *Sow.*
gutturosa, *Ducl.*
hordacea, *Phil.*
interrupta, *Gask.*
ionida, *Ducl.*
iodostoma, *Gask.*
kirostra, *Ducl.*
lachryma, *Sow.*
lepida, *Ducl.*
lyrata, *Ducl.*
miser, *Sow.*
mœsta, *C. B. Adams.*
naxia, *Mke.*
nigricans, *Sow.*
obesa, *C. B. Adams.*
Pacifica, *Gask.*
pallida, *Phil.*
parva, *Sow.*
pygmæa, *Sow.*
rugosa, *Sow.*
rugulosa, *Sow.*
scalarina, *Sow.*
spadicea, *Phil.*
sulcosa, *Sow.*
suturalis, *Gray.*
tæniata, *Phil.*
Terpsichore, *Leathes.*
varia, *Sow.*
varicosa, *Gask.*

Genus PYRENE, Bolten.

Shell mitra-shaped, fusiform; spire equal to, or longer than, the aperture, whorls tumid; outer lip slightly gibbous above, contracted below, margin not inflected, striated within; inner lip terminating in an elevated ridge, but with the teeth obsolete.

Syn. Conidea, *Swains.*

Ex. P. semipunctata, *Lamarck*, pl. 19, fig. 8. Shell, P. aurea, *Martini*, fig. 8, *a.*

The animal of this genus, according to the observation of one of the authors, bears the eyes about midway on the outer side of the tentacles; the shells are more or less mitriform, and the outer lip is not gibbous in the middle.

Species of Pyrene.

aspersa, *Sow.*
aurea, *Mart.*
concinua, *Brod.*
lugubris, *Kien.*
macrostoma, *Anton.*
marmorata, *Gray.*
obscura, *Sow.*
obtusa, *Sow.*
ovulata, *Lam.*
ovuloides, *C. B. Adams.*
rubicundula, *Quoy.*
semipunctata, *Lam.*
splendidula, *Sow.*
tringa, *Lam.*
undata, *Ducl.*
zelina, *Ducl.*

Sub-gen. CONELLA, Swainson.

Shell smooth, conic; aperture linear; inner lip smooth; outer lip striated internally, not thickened in the middle.

coniformis, *Sow.*
dormitor, *Sow.*
dubia, *Sow.*
Dupontii, *Kien.*
picata, *Swains.*
Philippinarum, *Reeve.*

Genus STROMBINA, Mörch.

Shell fusiform, turreted; spire acuminate, whorls gibbose, often nodulous; aperture elongate, narrow; inner lip with a large thickened callus; outer lip thickened, sinuated posteriorly; canal produced, somewhat recurved.

Ex. S. gibberula, *Sowerby*, pl. 19, fig. 9.

This genus comprises an assemblage of fusiform species of shells with gibbous whorls, thick and sinuated outer lips, and somewhat produced and recurved canals.

Species of Strombina.

angularis, *Sow.*
australis, *Gask.*
bicanalifera, *Sow.*
blanda, *Sow.*
clavulus, *Sow.*
dorsata, *Sow.*
elegans, *Sow.*
fusiformis, *Hinds.*
gibberula, *Sow.*
gibbosula, *Brod.*
Haneti, *Petit.*
hirundo, *Gask.*
lanceolata, *Kien.*
maculosa, *Sow.*
nivea, *Sow.*
pavonina, *Hinds.*
pulcherrima *Sow.*
recurva, *Sow.*
turrita, *Sow.*

Genus AMYCLA, H. and A. Adams.

Shell bucciniform, smooth, solid, variegated; aperture ovate; columella simple, truncate at the fore part; inner lip with a thick, defined callus; outer lip arcuated, crenate internally.

Syn. Nassa, sp. *Auct.*

Ex. A. corniculum, *Olivi*, pl. 19, fig. 10.

These mollusks have small variegated bucciniform

shells, but with an animal resembling that of *Columbella;* some of the species have been referred to *Nassa;* the *A. corniculum* is the *Buccinum fasciolatum* of Lamarck.

Species of Amycla.

conspersa, *Phil.*
corniculum, *Oliv.*
dermestoidea, *Lam.*
Haldemanni, *Dkr.*
Pfeifferi, *Phil.*
punctata, *Kien.*
tæniata, *Adams and Reeve.*

Sub-gen. ASTYRIS, H. and A. Adams.

Shell ovately fusiform, thin; spire acuminate, whorls smooth or transversely striated; aperture oval; inner lip simple, not callous; outer lip thin, sinuated posteriorly, lirate internally.

avara, *Say.*
avena, *Phil.*
clausiliformis, *Kien.*
dissimilis, *Stimp.*
Gouldiana, *Agass.*
lactea, *Sow.*
limata, *Say.*
marquesa, *Gask.*
nux, *Reeve.*
pulchella, *Blainv.*
rosacea, *Gould.*
sagitta, *Gask.*
secalina, *Phil.*
tenuis, *Gask.*
Turnbullii, *Linsl.*
unifascialis, *Lam.*
valga, *Gould.*
Veatleyi, *Dekay.*

Genus ENGINA, Gray.

Shell ovate-conic; spire acuminate, whorls with transverse nodulous bands or ribs; aperture linear, concave, with several broad oblique plaits in front; outer lip thickened, internally toothed, gibbous and grooved posteriorly.

Ex. E. pyrostoma, *Sowerby*, pl. 19, fig. 11.

The shells of this genus partake of the character of

Sistrum and of *Columbella*, to both of which genera they have been referred; they are small and pretty shells, ornamented with coloured nodulous bands.

Species of Engina.

acuminata, *Reeve.*
alveolata, *Kien.*
armillata, *Reeve.*
astricta, *Reeve.*
bicatenata, *Reeve.*
carbonaria, *Reeve.*
concinna, *Reeve.*
contracta, *Reeve.*
crocostoma, *Reeve.*
deformis, *Reeve.*
echinata, *Reeve.*
eximia, *Reeve.*
ferruginosa, *Reeve.*
forticostata, *Reeve.*
histrio, *Reeve.*
lauta, *Reeve.*
lineata, *Reeve.*
ocellata, *Reeve.*
parva, *Reeve.*
porphyrostoma, *Reeve.*
pulchra, *Reeve.*
pyrostoma, *Sow.*
recurva, *Reeve.*
rutila, *Reeve.*
trifasciata, *Reeve.*
turbinella, *Kien.*
zonata, *Reeve.*

Sub-gen. PUSIOSTOMA, Swainson.

Shell ovate, with the inner lip convex between the granular teeth; outer lip greatly thickened and toothed in the middle.

albinodosa, *Gask.*
chlorostoma, *Sow.*
Duclosiana, *Sow.*
mendicaria, *Lam.*
pisolina, *Lam.*

Fam. MARGINELLIDÆ.

Teeth on lingual membrane broad and lunate, with many conical, rather distant dentations, being very similar to those of *Voluta*. Tentacles close together at the base; eyes above the base, or near the middle of the

tentacles. Mantle with expanded side-lobes covering the shell; siphon elongate, simple at the base. Foot large, truncate in front, produced behind.

Operculum none.

Shell porcellanous, polished, with distinct plaits on the columella; outer lip with the margin thickened, or with a marginal callus.

The organization of the animals of this family is more in accordance with that of the Volutes than with that of the Cowries, although the form of the shells would seem to justify their having been sometimes associated with the latter. The mantle-margin is developed as in the *Cypræidæ*, and produces the porcellanous appearance of the shells, but there are distinct plaits on the columellar lip.

Genus ERATO, Risso.

Shell obovate, polished, or rarely, covered with tubercles; spire short, conical, distinct; aperture, narrow, linear; outer lip thickened towards the middle, denticulate within; columella with distinct plaits at the fore part.

Ex. E. lævis, *Donovan*, pl. 20, fig. 1. Shell, E. lævis, fig. 1, *a*.

The pretty little shells comprising this genus have been indifferently referred both to *Marginellana* and to *Cypræa*; from the former, however, they differ in not having the marginal varix, and from the latter in the plaits on the columella, and in the outer lip.

Species of Erato.

angiostoma, *Sow.*
gallinacea, *Hinds.*
guttula, *Sow.*
callosa, *Adams and Reeve.*
columbella, *Mke.*
lachryma, *Sow.*
lævis, *Donov.*
Maugeriæ, *Gray.*
scabriuscula, *Gray.*
sulcifera, *Sow.*
vitulina, *Hinds.*

Genus MARGINELLA, Lamarck.

Shell ovately oblong, smooth, polished; spire short or concealed; aperture elongated, truncated in front; columella plicate; outer lip with a thick marginal varix.

Syn. Porcellana, *Adans.*, not *Rumph.* or *Klein.* Dactylus, *Humph.*, not *Klein.* Pterygia, *Link.* Phænospira, *Hinds.* Marginellarius, *Dumeril.* Marginellus, *Montf.*

Ex. M. diadochus, *Adams and Reeve*, pl. 20, fig. 2. Shell, M. glabella, *Linnæus*, fig. 2, *a.*

The species are remarkable for the brilliancy and variety of their markings; they are very numerous along the shores of Africa, where they inhabit the clear sands, in somewhat shallow water; they glide along rapidly, and when seen in full activity are objects of singular interest and beauty.

Species of Marginella.

aurantia, *Lam.*
fulminata, *Kien.*
glabella, *Linn.*
guttata, *Dillw.*
irrorata, *Mke.*
labiata, *Valenc.*
lineatolabrum, *Gask.*
mosaica, *Sow.*
nivosa, *Hinds.*
piperita, *Hinds.*
Poucheti, *Petit.*
pyrulata, *Redf.*
pyrum, *Meusch.*
Saulcyana, *Petit.*
splendens, *Sow.*
undulata, *Mart.*

Sub-gen. GLABELLA, Swainson.

Volutiform; spire more or less conic, well-developed; pillar with basal plaits; inner lip obsolete; outer lip thick, toothed or crenate, rarely smooth.

Adansonii, *Kien.*
albocincta, *Sow.*
arenaria, *Yoldi.*
Belcheri, *Hinds.*
Bellii, *Sow.*
bifasciata, *Lam.*
Chemnitzii, *Dillw.*
Cleryi, *Petit.*
Cumingiana, *Petit.*
faba, *Linn.*
festiva, *Kien.*
formiculata, *Lam.*
Goodallii, *Sow.*
Guillaini, *Petit.*
hæmatitia, *Kien.*
harpæformis, *Sow.*
helmatina, *Rang.*
intermedia, *Sow.*
limbata, *Lam.*
liturata, *Mke.*
margarita, *Kien.*
marginata, *Kien.*
muscaria, *Lam.*
musica, *Hinds.*
nodata, *Hinds.*
nubeculata, *Lam.*
obtusa, *Sow.*
onychina, *Adams and Reeve.*
Petitii, *Duval.*
pseudofaba, *Sow.*
Reeveana, *Petit.*
scripta, *Hinds.*
striata, *Sow.*

Sub-gen. PRUNUM, Martini.

Shell oval; spire slightly prominent; inner lip very much developed, and forming a tumid rim all round the aperture.

albina, *Gask.*
apicina, *Mke.*
australis, *Hinds.*
carnea, *Storer.*
conoidalis, *Kien.*
curta, *Sow.*
crassilabrum, *Sow.*
evanida, *Sow.*
glans, *Mke.*
inconspicua, *Sow.*
livida, *Hinds.*
marginata, *Born.*
monilis, *Lam.*
nivea, *C. B. Adams.*
pellucida, *Pfeiff.*
prunosa, *Hinds.*
pygmæa, *Sow.*
Sowerbyana, *Petit.*

Storeria, *Couth.*
subcærulea, *Mart.*
Terversiana, *Petit.*
turbinata, *Sow.*
vesciculata, *Mart.*
vitrea, *Hinds.*
xanthostoma, *Mörch.*

Sub-gen. VOLUTELLA, Swainson.

Bulliform, ovate-oblong; spire either entirely, or almost, concealed; pillar with four oblique plaits at the fore part; aperture not striated; outer lip smooth, thickened; inner lip wanting.

angustata, *Sow.*
bullata, *Born.*
contaminata, *Gask.*
cornea, *Lam.*
dactylus, *Lam.*
Largillieri, *Kien.*
lilacina, *Sow.*
oblonga, *Swains.*

Sub-gen. CRYPTOSPIRA, Hinds.

Spire very short, nearly obsolete; last whorl gibbous posteriorly; columella with a few strong transverse plaits; inner lip not callous; outer lip thickened, not crenate internally.

amygdalum, *Kien.*
azona, *Mke.*
Bernardii, *Largill.*
blanda, *Hinds.*
cincta, *Kien.*
chrysomelina, *Redf.*
diadochus, *Adams and Reeve.*
elegans, *Gmel.*
ovulum, *Sow.*
pulchra, *Gray.*
quadrilineata, *Gask.*
quinqueplicata, *Lam.*
sapotilla, *Hinds.*
Sauliæ, *Sow.*
tricincta, *Hinds.*
undulata, *Chem.*
ventricosa, *Fisch.*

Genus PERSICULA, Schumacher.

Shell oval; spire small, depressed; aperture linear, emarginate anteriorly and posteriorly; inner lip with a

callosity at the hind part; columella straight, with four large plaits, and posteriorly some smaller and more obsolete folds; outer lip simple.

Syn. Marginella, *Link.*, not *Lam.*

Ex. P. carneola, *Chiaje*, pl. 20, fig. 3. Shell, P. fasciata, *Martini*, fig. 3, *a*.

In *Persicula* the outer lip is not margined externally, the inner lip is transversely plaited, and there is a callus at the hind part.

Species of Persicula.

avellana, *Lam.*
carneola, *Chiaje.*
catenata, *Mat. and Rack.*
Duchon, *Adans.*
fasciata, *Mart.*
fluctuata, *C. B. Adams.*
frumentum, *Sow.*
guttata, *Link.*
Hainesi, *Petit.*
imbricata, *Hinds.*
interruptolineata, *Muhlf.*
Kieneriana, *Petit.*
maculosa, *Kien.*
multilineata, *Sow.*
obesa, *Redf.*
pudica, *Gask.*
pulchella, *Kien.*
pulcherrima, *Gask.*
sagittata, *Hinds.*
Swainsoniana, *Petit.*
tessellata, *Lam.*

Sub-gen. GIBBERULA, Swainson.

Shell suboval; spire slightly prominent; outer lip posteriorly dilated and gibbous; columella with plaits at the fore part; inner lip broad, spreading.

clandestina, *Brong.*
grana, *Phil.*
guanacha, *D'Orb.*
miliaria, *Linn.*
minor, *C. B. Adams.*
minuta, *Pfeiff.*
monilis, *Linn.*
muralis, *Hinds.*
phrygia, *Sow.*
rufula, *Gask.*
zonata, *Brug.*

Genus PACHYBATHRON, Gaskoin.

Shell subcylindrical, striated longitudinally; spire flat, volutions perceptible; aperture narrow, channelled posteriorly; columella with strong, distant denticulations at the fore part; inner lip with a broad, thick, flat callus extending the entire length of the shell, transversely strongly grooved; outer lip thick, denticulate internally.

Ex. P. cassidiforme, *Gaskoin*, pl. 20, fig. 4.

The curious little shells forming this genus most resemble species of *Persicula*, but the callus of the inner lip is very much developed and furnished with strong transverse grooves.

Species of Pachybathron.

cassidiforme, *Gask.* marginelloideum, *Gask.*

Genus VOLVARIA, Lamarck.

Shell subcylindrical, semipellucid; spire short, obsolete; aperture narrow, anteriorly dilated; columella sinuous in front, subflexuous, obliquely truncated, and with four oblique plaits; outer lip slightly thickened, but without a marginal varix.

Syn. Hyalina, *Schum.*, not *Gray.* Volvarius, *Montf.*

Ex. V. triticea, *Lamarck*, pl. 20, fig. 5. Shell, V. pellucida, *Schumacher*, fig. 5, *a*.

The *Volvaria* of Lamarck appears to be restricted to one recent species, having the spire short and the outer lip only slightly thickened; the sub-genus *Volvarina*, however, is numerous in species.

Sub-gen. VOLVARINA, Hinds (Hyalina, *Gray*, not *Schum.*).

Shell subcylindrical; spire short, obtuse; aperture linear; columella plicate anteriorly; outer lip externally thickened, forming a slight marginal varix.

Albanyana, *Gask.*
Capensis, *Krauss.*
cylindrica, *Brown.*
Delessertiana, *Recluz.*
Dunkeri, *Krauss.*
fasciata, *Sow.*
fauna, *Sow.*
fusca, *Sow.*
fusiformis, *Hinds.*
gracilis, *C. B. Adams.*
Hindsiana, *Petit.*
inflexa, *Sow.*
lactea, *Kien.*
Lavalleana, *D'Orb.*
micans, *Petit.*
neglecta, *Sow.*
nitida, *Hinds.*
olivæformis, *Kien.*
oryza, *Lam.*
pallida, *Linn.*
Philippinarum, *Redf.*
punctulata, *Petit.*
rubella, *Sow.*
serrata, *Gask.*
tæniata, *Sow.*
triplicata, *Gask.*
triticea, *Lam.*
zonata, *Lam.*

Fam. DOLIIDÆ.

Teeth on lingual membrane in seven rows (3·1·3), central generally toothed, lateral in three series, converging, the inner often broad, the two outer subulate, versatile. Mantle enclosed, the siphon recurved. Foot small.

Operculum none.

Shell thin, ventricose; whorls with transverse ribs; aperture with an oblique notch in front.

M. Deshayes notices a curious fact in the habits of *Dolium*, which he states swells out the foot, when it desires to swim, with an enormous quantity of water, imbibed through certain pores, and in this condition progresses.

Genus DOLIUM, Browne.

Shell thin, roundly oval, ventricose, inflated; spire small; whorls transversely furrowed; aperture very large, with a short posteriorly reflected canal; inner lip thin, widely expanded; outer lip fimbriated or crenated.

Syn. Perdix, *Montf.* Galea, *Mart.* Dolites, *Klug.* Cassida, *Lang*, not *Linn.* Tonna, *Brunn.*

Ex. D. olearium, *Linnæus*, pl. 20, fig. 6. Shell, D. olearium, fig. 6, *a*.

The "Tuns," as they are sometimes called, known by their large, light, ventricose shells with transverse ribs or furrows, are found in the Mediterranean, Ceylon, China, Australia, and the Pacific.

Species of Dolium.

amphora, *Phil.*
australe, *Chem.*
cassis, *Bolt.*
Cumingii, *Hanley.*
Deshayesii, *Reeve*
fasciatum, *Mart.*
galea, *Linn.*
lactescens, *Mart.*
melanostoma, *Jay.*
olearium, *Linn.*
pennatum, *Mart.*
perdix, *Linn.*
tessellatum, *Lam.*
zonatum, *Green.*

Genus CADIUM, Link.

Shell ovately globose, thick, with transverse elevated ribs; aperture ringent; columella with numerous transverse plaits, or with callous prominences; outer lip thickened, greatly reflected, and plicately dentate.

Syn. Malea, *Valenciennes.*

Ex. C. pomum, *Linnæus*, pl. 20, fig. 7. Shell, C. ringens, *Swainson*, fig. 7, *a*.

Cadium, consisting of but few species, differs from *Dolium* principally in its solid structure and ringent aperture; its outer lip, moreover, is strongly toothed, thickened, and reflected.

Species of Cadium.

dentatum, *Barnes.*
pomum, *Linn.*
ringens, *Swains.*

Genus RINGICULA, Deshayes.

Shell small, ventricose, smooth or transversely striated; spire small; aperture with an oblique notch in front; columella callous, strongly plicated; outer lip thickened and reflected, with a marginal callus.

Syn. Auriculina, *Gratel.*, not *Gray.* Auricularia, *De la Beche.*

Ex. R. buccinea, *Deshayes*, pl. 20, fig. 8.

From an examination of the animal in spirits, it appears that the eyes are on the outer bases of subulate tentacles, and that the foot is unprovided with an operculum. Many allied fossil genera are of much larger size than the existing species of *Ringicula*, and approach even still closer, in the character of the shell, to the other members of this family.

Species of Ringicula.

acuta, *Phil.*
australis, *Hinds.*
buccinea, *Desh.*
caron, *Hinds.*
exserta, *Hinds.*
grandinosa, *Hinds.*
propinquans, *Hinds.*

Fam. SYCOTYPIDÆ.

Tongue with the rachis unidentate, pluræ with three uncini (3·1·3), forming seven rows of teeth on the lingual membrane. Tentacles subulate, with the eyes at their outer bases. Mantle produced on each side, covering the shell; siphon straight, elongated. Foot thin, simple, produced posteriorly.

Operculum none.

Shell ventricose, thin, transversely ribbed and cancellated; aperture with a straight canal in front.

The animals of this group crawl very rapidly, bearing their light, elegantly-formed shells easily, and, with their neck stretched out, their siphon exserted, and their foot greatly expanded, present remarkable objects of contemplation to the malacozologist.

Genus SYCOTYPUS, Browne.

Shell pyriform, light, ventricose, ribbed and cancellated; spire very short; aperture large; columella simple; canal straight, elongated; outer lip thin, entire.

Syn. Ficus, *Bolt.*, not *Linn.* Pyrula (part), *Lam.* Ficula, *Swains.* Otus, *Risso.*

Ex. S. ficus, *Linnæus*, pl. 21, fig. 1. Shell, S. Dusumieri, *Valenciennes*, fig. 1, *a*.

The *Sycotypi* are delicately-tinted creatures, being generally flesh-coloured, with faint, marbled, crimson and pink markings; their eyes are large and black, and their long flat heads and necks usually white.

Species of Sycotypus.

decussatus, *Wood.*
Dusumieri, *Valenc.*
ficoides, *Lam.*
ficus, *Linn.*
gracilis, *Phil.*
reticulatus, *Lam.*

Fam. VELUTINIDÆ.

Tongue armed with a single series of broad, hooked, serrated teeth, flanked on each side by a triple row of laterals, the two outer rows being simple, and the inner row broad, hooked, and serrated. Head broad; tentacles subulate, blunt, far apart, with the eyes on prominences at their outer bases. Mantle with the margin developed all round, and more or less reflexed over the shell. Foot large and oblong.

Operculum none.

Shell ear-shaped; aperture wide, entire in front.

The operculigerous lobe in this family is developed, in common with the lateral and anterior portions of the mantle, so as to be capable of being reflexed over the sides of the shell.

Genus VELUTINA, Fleming.

Shell thin, covered with a velvety epidermis, volutions few, last whorl ventricose, large; spire small, obtuse, submarginal, suture deep; aperture very large, patulous, entire; outer lip acute.

Syn. Galericulum, *Brown.*

Ex. V. lævigata, *Linnæus*, pl. 21, fig. 2. Shell, V. lævigata, fig. 2, *a*.

The *Velutinidæ* are strictly marine, being met with sometimes far out at sea, and at considerable depths. Usually, however, they are found living on stones near low-water mark. They are principally inhabitants of northern seas, and are not very numerous in species.

Species of Velutina.

capuloidea, *Blainv.*
coriacea, *Pallas.*
cryptospira, *Midd.*
lævigata, *Linn.*
Sitkensis, *A. Adams.*

Sub-gen. LIMNERIA, H. and A. Adams.

Shell solid, semiglobose, subspiral; aperture wide, expanded, extending posteriorly beyond the apex; inner lip oblique, reflexed posteriorly, straight and acute anteriorly.

Caspiensis, *H. and A. Adams.*
zonata, *Gould.*

Sub-gen. VELUTELLA, Gray.

Shell thin, flexible, pellucid, smooth, membranaceous; spire rather elevated; aperture oblong; columella flexuous.

plicatilis, *Müll.*

Fam. LAMELLARIIDÆ.

Teeth on lingual membrane in three or seven series, the central broad, the lateral versatile; lateral teeth simple, curved. Tentacles separated at their bases, and bearing the sessile eyes at their origin externally. Mantle included, lining the shell. Foot oblong, obtusely quadrate in front, rounded behind; hind or operculigerous

lobe greatly developed, entirely covering and concealing the shell.

Operculum none.

Shell thin, spiral, covered by the hind lobe of the foot.

The part of the animal which conceals the shell is usually regarded as the mantle; it appears, however, to be more analogous to the operculigerous lobe of some of the *Naticidæ*, which more or less encroaches on the hind portion of the shell, and in one genus, *Catinus*, entirely conceals it.

Genus LAMELLARIA, Montagu.

? Mantle convex, arcuated, thick, tubercular, anterior fold median.

Shell spiral, thin, pellucid; spire tumid, small; columella greatly receding; aperture very large, entire.

Syn. Marsenia, *Leach.* Sigaretia, *Rafin.* Oxinöe, *Couth.*

Ex. L. tuberculosa, *H. and A. Adams*, pl. 21, fig. 3, 3, *a*. Shell, L. perspicua, *Linnæus*, fig. 3, *b*.

The figure of the animal given is taken from a specimen in spirits, in Mr. Cuming's collection, and appears to be an undescribed species.

Species of Lamellaria.

antarctica, *Couth.*
glacialis, *Sars.*
perspicua, *Linn.*
prætenuis, *Couth.*
tuberculosa, *H. and A. Adams.*

Genus CRYPTOCELLA, H. and A. Adams.

? Mantle depressed, subverrucose or smooth, anterior fold median.

Shell thin, pellucid, calcareous; spire small; aperture very large, patulous; inner lip receding.

Syn. Lamellaria, sp. *Mont.*

Ex. C. latens, *Müller*, pl. 21, fig. 4, 4, *a.* Shell, C. tentaculata, *Montagu*, fig. 4, *b.*

This form differs from *Lamellaria* in the back not being tubercled, and in the position of the eyes; it has not the fissure on the back described as peculiar to *M. prodita* by Dr. Lóven. The shell is more calcareous than that of *Lamellaria.*

Species of Cryptocella.

latens, *Midl.* tentaculata, *Mont.*

Genus MARSENINA, Gray.

Teeth, central (1), lateral (3·3), hooked, equal. ? Mantle depressed, very thin or fissured on the back, subverrucose; anterior fold subsinistral, and the lateral canal dextral.

Shell elongated, opaque; spire minute; outer lip somewhat straight.

Syn. Lamellaria, sp. *Lóven.*

Ex. M. prodita, *Lóven.*

This genus differs from the others of the family in the mantle (? operculigerous lobe) being fissured down the back.

Genus CORIOCELLA, Blainville.

? Mantle deeply fissured and bilobed in front, the surface depressed and covered with numerous hexagonal tubercles.

Shell spiral, calcareous, ear-shaped, thin, subopaque; spire short, whorls rounded, last whorl large; aperture patulous.

Syn. Sigaretus, *Cuvier*, not *Lam.* Cryptothyra, *Menke.* Chelinotus, *Swains.*

Ex. C. nigra, *Quoy and Gaimard*, pl. 21, fig. 5, 5, *a.* Shell, C. nigra, fig. 5, *b.*

The animal figured is very large, and entirely of a black colour; it is a native of the Island of Tonga; a species, of which the animal is also black and the shell very similar, is found in the Philippine Archipelago, and another, *C. Ophione*, is from Australia and New Zealand.

Species of Coriocella.

nigra, *Quoy and Gaim.* Ophione, *Gray.*

Fam. NATICIDÆ.

Animal bulky. Tongue short, with seven rows of teeth (3·1·3), consisting of a quadrate, broad-based, central tooth, flanked by three laterals on each side. Head small; tentacles lanceolate, wide apart, united by a veil; eyes usually absent, or very minute and placed beneath the tentacular veil. Mantle enclosed. Foot very large and expanded, rounded at both ends, much produced in front,

where it is furnished with a fold which covers the head and tentacles; operculigerous lobe very ample, reflexed upon and partially concealing the sides and back of the shell.

Operculum distinct, spiral, few-whorled.

Shell spiral, usually smooth or polished, more or less globular; aperture semilunar, sometimes very large.

The existence of a large operculigerous lobe is a remarkable feature in this family, and serves, at once, to distinguish it; in the polished *Mamma* it nearly covers, and in *Catinus* is extended quite across, the shell. The size of the operculum in this group seems not to depend upon that of the mouth of the shell, being most developed in those genera which have a contracted aperture, and smallest in those where the mouth is wide; thus, in *Catinus* it is horny and rudimentary; in *Ruma* horny, but large; and in *Natica* ample and calcareous. The eggs of the *Naticidæ* are agglutinated into broad, subspiral bands, very slightly attached, and resting on the sands. These animals are carnivorous and very predaceous, feeding on the smaller bivalves, in which they bore circular holes to extract the flesh.

Genus NATICA, Adanson.

Animal entirely retractile within the shell.

Operculum horny, with a calcareous outer layer.

Shell subglobose; spire rather elevated; aperture semilunar; columella adherent to, and spirally contorted in, the umbilicus; apex more or less dilated and truncate, more rarely convex or rounded.

Syn. Naticus, *Montf.* Lunatus, *Humph.* Nacca, *Risso.* Cochlis, *Bolt.* Naticarius, *Dum.*

Ex. N. maculosa, *Lamarck*, pl. 22, fig. 1. Operculum, N. canrena, *Linnæus*, fig. 1, *a*, 1, *b*. Shell, N. canrena, fig. 1, *c*.

The animals of this genus crawl quickly, and, when contracted, entirely enter their shell, which they close with their shelly operculum. They live in sandy places, hiding under the surface and burrowing after bivalves, which they pierce with the siliceous teeth of their lingual membrane, sucking the juices through their long, retractile proboscis; when they crawl they leave deep traces behind them. They are found in all parts of the globe, though the larger and more showy species are tropical; they have been observed to range from low-water to ninety fathoms.

Species of Natica.

Adansonii, *Phil.*
affinis, *Busch.*
alapapilionis, *Chem.*
arachnoidea, *Gmel.*
areolata, *Recluz.*
Broderipiana, *Recluz.*
Cailliaudi, *Recluz.*
canrena, *Linn.*
catenata, *Phil.*
Cayennensis, *Recluz.*
Chinensis, *Lam.*
cincta, *Recluz.*
cinnamomea, *Mke.*
clausa, *Brod. and Sow.*
collaria, *Lam.*
Colliei, *Recluz.*
cruentata, *Gmel.*
dilecta; *Gould.*
Dillwynii, *Payr.*
elegans, *Recluz.*
Elenæ, *Recluz.*
euzona, *Recluz.*
Fanel, *Adans.*
filosa, *Phil.*
Forskalii, *Chem.*
fulgurans, *Recluz.*
Gambiæ, *Recluz.*
globosa, *Chem.*
gracilis, *Recluz.*
Gualteriana, *Recluz.*
Guillemini, *Payr.*
Haneti, *Recluz.*
hebræa, *Mart.*
intricata, *Donov.*
iostoma, *Mke.*
labrella, *Lam.*
lineata, *Chem.*
lineolata, *Phil.*
lupina, *Desh.*
macilenta, *Phil.*

Mahesensis, *Recluz.*
Malabarica, *Recluz.*
maroccana, *Chem.*
marochiensis, *Recluz.*
onca, *Bolt.*
orientalis, *Gmel.*
pallens, *Phil.*
papilionacea, *Desh.*
picta, *Recluz.*
pygmæa, *Phil.*
Rizzæ, *Phil.*
rufa, *Born.*
rufilabris, *Recluz.*
solida, *Blainv.*
Souleytiana, *Recluz.*
spadicea, *Blainv.*
stercus-muscarum, *Chem.*
tessellata, *Phil.*
Tournefortii, *Recluz.*
trifasciata, *Recluz.*
undata, *Meusch.*
unifasciata, *Lam.*
variolaria, *Recluz.*
vitellus, *Linn.*
vittata, *Gmel.*
Zealandica, *Quoy.*
zebra, *Chem.*
zonalis, *Recluz.*

Sub-gen. STIGMAULAX, Mörch.

Shell solid, subglobose, whorls rounded, sulcate or cancellated; umbilicus with a spiral funiculus. Operculum calcareous, with several ridges on the outer surface.

rugosa, *Chem.*
semisulcata, *Gray.*
sulcata, *Born.*

Genus LUNATIA, Lamarck.

Animal entirely retractile within the shell.

Operculum simple, cartilaginous.

Shell oval, subglobose; spire rather elevated; aperture semilunar; inner lip thin, or with a moderate callus; umbilicus wide, pervious, not funiculate.

Syn. Natica, *Risso*, not *Adans.*

Ex. L. monilifera, *Lamarck*, pl. 22, fig. 2. Operculum, L. monilifera, fig. 2, *a*, 2, *b*. Shell, L. monilifera, fig. 2, *c*.

In this genus the shells are usually covered with a dark

epidermis; they are not so thick and solid as the shells of *Natica;* nor is the umbilicus filled with a funiculus or spiral callosity. The species seem to inhabit cold or temperate, rather than tropical climates, which may account for their more sombre colours; some northern forms, as *L. heros* and *L. herculea,* attain to a very large size.

Species of Lunatia.

Alderi, *Forbes.*
algida, *Gould.*
aperta, *Lóven.*
atrocyanea, *Phil.*
Buriascensis, *Recluz.*
castanea, *Lam.*
caurina, *Gould.*
duplicata, *Say.*
fragilis, *Leach.*
Francisca, *Recluz.*
Gallapagosa, *Recluz.*
globosa, *King.*
Grœnlandica, *Beck.*
herculea, *Midd.*
heros, *Say.*
immaculata, *Totten.*
impervia, *Phil.*
Jamaicensis, *C. B. Adams.*
lactea, *Sow.*
Lewisii, *Gould.*
livida, *Lask.*
melastoma, *Sow.*
monilifera, *Lam.*
Montagui, *Forbes.*
nana, *Möll.*
pallida, *Brod. and Sow.*
Panamana, *Recluz.*
Patagonica, *Phil.*
pisiformis, *Recluz.*
plicatula, *Nutt.*
plumbea, *Lam.*
puncticulata, *Recluz.*
pusilla, *Say.*
Raynoldiana, *Recluz.*
rhodostoma, *Phil.*
septentrionalis, *Beck.*
soluta, *Gould.*
tenuis, *Recluz.*
triseriata, *Say.*
variabilis, *Recluz.*
violacea, *Sow.*

Sub-gen. ACRYBIA, H. and A. Adams.

Shell globular, inflated, thin; whorls rounded, spirally striated; columella curved in the middle; umbilicus covered by a callus; outer lip very thin, flexible.

flava, *Gould.*

Genus NEVERITA, Risso.

Operculum simple, cartilaginous.

Shell orbicular, depressed; spire flattened; aperture wide, semilunar; inner lip straight, callous; columella adherent to, and spirally contorted in, the umbilicus, the apex more or less dilated and truncate.

Syn. Naticaria, *Swains.*

Ex. N. Chemnitzii, *Recluz*, pl. 22, fig. 3. Operculum, N. glaucina, *Lamarck*, fig. 3, *a*, 3, *b*. Shell, N. glaucina, fig. 3, *c*.

In this genus the spire of the shell is depressed, the aperture very wide, and the large umbilicus is funiculate and partially concealed by a callous, tongue-shaped, shelly process; the operculum is horny, and nearly closes the mouth of the shell.

Species of Neverita.

albumen, *Linn.*
ampla, *Phil.*
bicolor, *Phil.*
Campechiensis, *Recluz.*
Chemnitzii, *Recluz.*
conica, *Lam.*
didyma, *Phil.*
glaucina, *Lam.*
Incei, *Phil.*
intermedia, *Recluz.*
Lamarckiana, *Recluz.*
olla, *M. de Serr.*
papyracea, *Busch.*
patula, *Sow.*
Peteveriana, *Recluz.*
Philippiana, *Recluz.*
Reclusiana, *Desh.*
unifasciata, *Lam.*
vesicalis, *Phil.*

Genus AMPULLINA, Lamarck.

Shell ventricose, imperforate; spire with the apex acute, whorls smooth, without epidermis; aperture very wide;

inner lip with a large, smooth callus covering part of the body-whorl and concealing the umbilicus.

Syn. Globulus, *Sow.*, not *Schum.* Ampullaria, *Flem.*, not *Lam.* Euspira, *Agass.* Bulbus, *Brown*, not *Humph.* Globularia, *Swains.* Deshayesia, *Raul.* Cernina, *Gray.* Anomphala, *Jonas.*

Ex. A. fluctuata, *Sowerby*, pl. 22, fig. 4.

The only recent species known of this genus, which has, however, several extinct representatives, is an inhabitant of the Philippines, where it is found in concealed situations in the slimy mud of shallow bays; the animal is very bulky and unable entirely to retract itself within the shell; the operculum, if present, is quite rudimentary.

Genus RUMA, Chemnitz.

Animal retractile within the shell.

Operculum cartilaginous, oblong, narrower than the aperture.

Shell ovate-acute, rather thin; spire pointed, whorls often zoned; aperture oblong; inner lip straight, narrow, reflexed; columella usually black or fusco-purpurescent; umbilicus nude, pervious, not funiculate.

Syn. Mamma (part), *Klein.* Mamilla, *Schum.* Naticella, *Swains.*

Ex. R. mamillaris, *Born*, pl. 22, fig. 5. Operculum, R. mamillaris, fig. 5, *a*, 5, *b*. Shell, R. mamillaris, fig. 5, *c*.

By means of its strong, well-developed, fleshy foot, the animal of this genus readily ploughs up the yielding sand, seeking for bivalves; but when the tide rises, the side lobes and hind part of the foot are expanded, and the *Ruma* flaps along above the surface of the sand.

Species of Ruma.

Bahiensis, *Recluz.*
bicincta, *Recluz.*
bifasciata, *Gray.*
fibrosa, *Soul.*
litterata, *Soul.*
macrotrema, *Adams and Reeve.*
mamillaris, *Born.*
maura, *Lam.*
melanastomoides, *Quoy.*
opaca, *Recluz.*
perspectiva, *Recluz.*
Priamus, *Recluz.*
putamen, *Meusch.*
Samarensis, *Recluz.*
Sebæ, *Soul.*
Senegalensis, *Recluz.*
sinniæ, *Chem.*
sinnioidea, *Recluz.*
Zanzebarica, *Recluz.*

Genus MAMMA, Klein.

Animal entirely retractile within the shell.

Operculum large, horny, simple.

Shell ovate or subovate, solid, smooth, usually without epidermis; spire small, acute, whorls simple; aperture semicircular; inner lip oblique, thickened, callous; umbilicus funiculate; columella adherent to, and spirally contorted in, the umbilicus, the apex more or less dilated, convex and rounded.

Syn. Uber, *Humph.* Albula, *Bolt.* Polinices, *Montf.* Mamilla, *Gray*, not *Schum.* Eucaryum, *Ehrenb.* Mamillaria, *Swains.* Naticina, *Guild.*

Ex. M. mamilla, *Linnæus*, pl. 22, fig. 6. Operculum, M. Cumingii, *Recluz*, fig. 6, *a*, 6, *b*. Shell, M. mamilla, fig. 6, *c*.

The animals of this peculiar type of *Naticidæ* inhabit clear sand and muddy sand-flats, and may be readily taken at low-water by following the marks they leave, when they are usually discovered concealed under little

heaps of sand. When the animal is seen crawling, fully expanded and undisturbed, the hind lobe of the foot nearly covers the entire surface of the shell.

Species of Mamma.

alba, *Montf.*
albula, *Rumph.*
amiculata, *Phil.*
aurantia, *Lam.*
Bernardii, *Recluz.*
candidissima, *Le Guillou.*
Caribæa, *Phil.*
casta, *Phil.*
columnaris, *Recluz.*
Cora, *D'Orb.*
Cumingiana, *Recluz.*
Draparnaudii, *Payr.*
dubia, *Recluz.*
Flemingiana, *Recluz.*
funiculata, *Recluz.*
fuscata, *Chem.*
intemerita, *Phil.*
mamilla, *Linn.*
nitida, *Donov.*
ochrostoma, *Recluz.*
pallium, *Recluz.*
Panamensis, *Recluz.*
perspicua, *Recluz.*
pes-elephantis, *Chem.*
porcellanea, *D'Orb.*
Powisiana, *Recluz.*
pyriformis, *Recluz.*
ravida, *Sow.*
Salangonensis, *Recluz.*
straminea, *Recluz.*
Texasiana, *Phil.*
uberina, *Valenc.*
Vavasi, *Le Guillou.*
vestalis, *Phil.*
virginea, *Recluz.*

Genus NATICINA, Gray.

Shell oblong-ovate, thin, ventricose; spire acuminate, whorls, transversely striated or sulcate; aperture large, oblong; inner lip straight, thin, with a slight callosity in the middle; umbilicus open or partially covered.

Ex. N. papilla, *Gmelin*, pl. 22, fig. 7.

The species of this group seem intermediate between *Ruma* and *Catinus;* they inhabit tolerably deep water, and are usually of an uniform white colour; the animal and operculum are not yet known.

Species of Naticina.

acuminata, *Adams and Reeve.*
bilix, *Conr.*
Desmoulinsiana, *Recluz.*
Gouldiana, *Recluz.*
Lamarckiana, *Recluz.*
Linneana, *Recluz.*
mamillaris, *Linn.*
papilla, *Gmel.*
sulcata, *Recluz.*

Genus CATINUS, Klein.

Operculigerous lobe greatly developed, nearly covering and concealing the shell.

Operculum very small and rudimentary.

Shell oval, flattened, ear-shaped, striated; spire minute, depressed; aperture very wide, oblique; umbilicus none; inner lip curved posteriorly, and spread thinly over the body-whorl.

Syn. Stomatia, *Hill*, not *Lam.* Auris-Veneris, *Humph.* Auriformis, *Gevers.* Haliotis, *Adans.*, not *Linn.* Cryptostoma, *Blainv.*

Ex. C. Leachii, *Blainville*, pl. 22, fig. 8. Operculum, C. concavus, *Lamarck*, fig. 8, *a*, 8, *b*. Shell, C. concavus, fig. 8, *c*.

The *Catini* come from the West Indies, China, India, and South America. They live on muddy sand-flats; in their habits they are sluggish and slow-moving, and very timid; when crawling they constantly explore the surface with the produced fore lobe of the foot, which is also the instrument employed in burrowing in the sand; the operculum, very small, will be found under the hind part of the body-whorl of the shell.

Species of Catinus.

agriensis, *Recluz.*
Antillarum, *Recluz.*
apertus, *Anton.*
bifasciatus, *Recluz.*
Carolius, *Chenu.*
Cuverianus, *Recluz.*
Delessertii, *Chenu.*
depressus, *Phil.*
Deshayesianus, *Recluz.*
haliotideus, *Linn.*
insculptus, *Adams and Reeve.*
Italicus, *Chenu.*
Javanicus, *Chenu.*
lacteus, *Klein.*
lævigatus, *Lam.*
latifasciatus, *Adams and Reeve.*
Leachii, *Blainv.*
Listeri, *Recluz.*
maculatus, *Say.*
perspectivus, *Say.*
planulatus, *Chenu.*
sinuatus, *Recluz.*
striatus, *M. de Serr.*
Turonicus, *Recluz.*
zonalis, *Quoy and Gaim.*

Sub-gen. SIGARETUS, Lamarck (not *Cuv.*).

Shell orbicular, conoidal or convex; aperture rounded; umbilicus open, or covered by a fold of the inner lip; spire oblique, short.

clathratus, *Bosc.*
concavus, *Lam.*
Levesquei, *Recluz.*
neritoideus, *Linn.*
Petitianus, *Recluz.*
striatellus, *Recluz.*

Genus AMAURA, Möller.

Animal allied to *Natica;* foot small, compact, destitute of posterior lobe, anterior lobe deeply sinuated; eyes subcutaneous, situated at the internal base of the lobe.

Operculum terminal, horny, paucispiral, thin.

Shell ovate, imperforate, smooth; spire produced; aperture obpyriform, about half the length of the shell; columella short, simple.

Ex. A. candida, *Möller*, pl. 22, fig. 9.

The species of this genus hitherto discovered are but few in number, and are from the Northern Seas; the shells are nearly devoid of colour, and are covered with a thin, horny epidermis. Möller has described the animal, and mentions the fact of the existence of eyes, which, however, are partly concealed under the skin; the other genera of this family are stated to be blind.

Species of Amaura.

canaliculata, *Gould.*
candida, *Möll.*
cornea, *Müll.*

Fam. CASSIDIDÆ.

Lingual membrane short, broad, triangular, with many rows of similar, lancet-shaped teeth, and a single small dentated tooth in the central series. Mantle enclosed, with a recurved siphon. Foot large, dilated.

Operculum annular; nucleus in the middle of the straight inner edge.

Shell ventricose, subglobose, whorls often varied; aperture with a recurved canal; outer lip thickened; inner lip wrinkled or granular.

The "Helmet Shells," comprising many of the largest known Gasteropods, form a very natural group; they principally inhabit the warmer regions of the globe.

Genus CASSIS, Browne.

Operculum oblong, narrow, small.

Shell triangular, last whorl large, with irregular varices;

aperture linear, long, with a short, sharply-recurved, sinistral canal in front; inner lip forming a large, transversely-wrinkled plate spread over the body-whorl; outer lip thickened, reflected, plicate or toothed.

Syn. Cassidea, *Brug.*, *Schum.*, not *Link.* Cassida, *Humph.*, not *Lang* or *Linn.*

Ex. C. cornuta, *Linnæus*, pl. 23, fig. 1. Operculum, C. cornuta, fig. 1, *a*, 1, *b*. Shell, C. tuberosa, *Linnæus*, fig. 1, *c*.

The *Cassides* are active and voracious, living in sandy localities where bivalves abound, and upon which they prey. They are found in the Mauritius, Ceylon, the Philippines, the West Indies, and the Mediterranean; the larger species are employed in the manufacture of shell cameos, which are carved from the large enamelled plate of the inner lip.

Species of Cassis.

cornuta, *Linn.*
fimbriata, *Quoy and Gaim.*
flammea, *Linn.*
Madagascariensis, *Lam.*
spinosa, *Meusch.*
tuberosa, *Linn.*

Genus SEMICASSIS, Klein.

Operculum half-ovate, moderate, nucleus on the middle of the straight inner edge.

Shell ovate, transversely grooved; spire moderate, acute, whorls more or less tuberculated; aperture oblong, emarginate anteriorly; inner lip obliquely rugosely plicated; outer lip reflexed and transversely plicated.

Syn. Cassidea, *b. Swains.*

Ex. S. anceps, *H. and A. Adams*, pl. 23, fig. 2.

Operculum, S. glauca, *Linnæus*, fig. 2, *a*, 2, *b*. Shell, S. sulcosa, *Born*, fig. 2, *c*.

The oval form, irregular varices, and rather pointed spire serve to characterize this genus; the nature of the operculum at once distinguishes it from *Cassis*, and its presence from *Morum*.

Species of Semicassis.

anceps, *H. and A. Adams.*
canaliculata, *Brug.*
cicatricosa, *Meusch.*
gibba, *Gmel.*
Japonica, *Reeve.*
pila, *Reeve.*
recurvirostrum, *Wood.*
Saburon, *Adans.*
semigranosa, *Lam.*
sulcosa, *Born.*
tessellata, *Chem*
ventricosa, *Mart.*

Sub-gen. PHALIUM, Link (Bezoardica, *Schum.*).

Shell transversely striated; spire acute, whorls angulated, varied; inner lip rugosely plicate; outer lip strongly dentate within.

areola, *Linn.*
bisulcata, *Schub. and Wag.*
coronulata, *Sow.*
decussata, *Linn.*
exarata, *Reeve.*
glauca, *Linn.*
plicata, *Linn.*
undata, *Mart.*

Sub-gen. CASMARIA, H. and A. Adams (Cassidea, *Swainson*, not *Link*).

Shell smooth, whorls simple or subplicate; spire somewhat elevated; inner lip smooth; outer lip usually simple or slightly crenate internally.

achatina, *Lam.*
paucirugis, *Mke.*
pyrum, *Lam.*
quadrata, *Link.*
turgida, *Reeve.*
vibex, *Linn.*

Genus CASSIDEA, Link.

Mantle-margins reflexed over the lips of the shell.

Operculum none.

Shell oval; spire short; aperture straight, narrow, channelled posteriorly; columella toothed; outer lip involute, toothed; varices none, or obsolete.

Syn. Cypræcassis, *Stutch.*

Ex. C. testiculus, *Linnæus*, pl. 23, fig. 3.

Cassidea resembles *Morum*, but the shell is not cancellated; the lobes of the mantle are expanded, and, according to *Stutchbury*, cover both lips of the shell; the foot is destitute of operculum; the inner lip is spreading, but the margin is not free, as in *Cassis*, and the columella is transversely plicate, as in *Cypræa.*

Species of Cassidea.

rufa, *Linn.*
tenuis, *Wood.*
testiculus, *Linn.*

Genus LEVENIA, Gray.

Operculum narrow, the nucleus on the middle of the straight edge.

Shell ovately-subcylindrical; spire conical, whorls nodulous, the penultimate distorted and gibbous; aperture narrow, contracted in the middle; inner lip moderate, plicated; outer lip thin, not reflexed, internally plicated.

Syn. Cassis sp., *Sow.*

Ex. L. coarctata, *Sowerby*, pl. 23, fig. 4. Operculum, L. coarctata, fig. 4, *a*, 4, *b*.

The thin, inflexed outer lip of *Levenia* at once distinguishes the genus from others in the family; the operculum is small and very narrow, being adapted to the contracted aperture; the shell, which is covered with a horny epidermis, and the peculiar operculum, are all at present known concerning the genus.

Genus SCONSIA, Gray.

Operculum— ?

Shell ovately-fusiform, transversely grooved, with a single longitudinal varix; spire acuminated; aperture elongated; canal very short, slightly recurved; inner lip regularly plicated, anterior plaits the largest; outer lip thickened, subreflexed, internally plicated.

Syn. Cassidaria sp., *Lam.*

Ex. S. striata, *Lamarck*, pl. 23, fig. 5.

The texture of the shell in this genus is very peculiar, being transversely striated and not tubercled, as in *Galeodea*, and the canal is neither so long, nor so recurved, as in that genus; the operculum and animal are unknown.

Genus GALEODEA, Link.

Operculum ovate, outer edge sinuous, nucleus on the hinder third of outer margin.

Shell oval, last whorl ventricose, tuberculated; aperture narrow, ending anteriorly in a produced, recurved canal; inner lip plicated, widely spread over the body-whorl; outer lip reflected and crenate.

Syn. Morio, *Montf.* Echinora, *Schum.* Cassidaria, *Lam.*

Ex. G. rugosa, *Linnæus*, pl. 23, fig. 6. Operculum, G. echinophora, *Linnæus*, fig. 6, *a*, 6, *b*. Shell, G. echinophora, fig. 6, *c*.

The form and structure of the operculum in this genus is very peculiar; the shells are known by their transversely ribbed and nodulous whorls, and their prominent, recurved, siphonal canal; they are not numerous in species.

Species of Galeodea.

acuta, *Gray*.
Deshayesii, *Duval*.
echinophora, *Linn*.
rugosa, *Linn*.
Tyrrhena, *Chem*.

Genus MORUM, Bolten.

Shell ovately-triangular, tuberculated; spire very short, apex mucronate; aperture linear, anteriorly emarginate; columella with papillary striæ; outer lip reflected, internally plicated.

Syn. Hystrix, *Humph.*, not *Linn*. Ersina, *Gray*. Lambidium, *Link*. Cassidea, *g. Schum*. Oniscia, *Sow*. Theliostoma, *Auct*.

Ex. M. oniscus, *Linnæus*, pl. 23, fig. 7.

In the genus *Morum* the back of the shell is tuberculated, and the shell is covered with a fine, velvety epidermis. There are about nine species known.

Species of Morum.

Lamarckii, *Desh*.
oniscus, *Linn*.
tuberculosum, *Sow*.
xanthostoma, *A. Adams*.

Sub-gen. ONISCIDIA, Swainson.

Shell cancellated; spire acuminated; inner lip widely spread over the body-whorl, and granulated; outer lip thickened and denticulate.

cancellatum, *Sow.*
Dennisoni, *Reeve.*
exquisitum, *Adams and Reeve.*
grande, *A. Adams.*
Strombiforme, *Reeve.*

Fam. SCALIDÆ.

Lingual riband with no central denticles, but with transverse rows of teeth formed of unguicular, simple uncini or laterals. Tentacles subulate, with the eyes on the outer side of their bases. Mantle enclosed, with a rudimentary siphonal fold. Foot obtusely triangular, grooved below, furnished in front with a fold or mentum.

Operculum horny, spiral, of few whorls.

Shell spiral, turreted, variced; aperture entire, without any notch or canal.

The animals in this family are predaceous, and their shells, for the most part of a white colour, are remarkable for the extreme elegance of their form and delicacy of sculpture.

Genus SCALA, Klein.

Shell usually pure white, solid, lustrous, turreted, many-whorled; whorls convex, sometimes separated, ornamented with numerous longitudinal ribs; aperture round, peristome continuous, thickened.

Syn. Scalarus, *Montf.* Scalaria, *Lam.* Acione,

Leach. Acionea, *Desh.* Cyclostoma, *Schum.*, not *Lam.* Turbina, *Browne.* Scalatarius, *Dumer.*

Ex. S. lamellosa, *Lamarck*, pl. 23, fig. 8. Operculum, S. clathrus, *Linnæus*, fig. 8, *a*, 8, *b*. Shell, S. scalaris, *Linnæus*, fig. 8, *c*.

The animal exudes a purple fluid when molested; nearly one hundred species have been described, chiefly from the Eastern Seas; China and the Philippines, however, harbour the greatest number; five species are inhabitants of the British Isles.

Species of Scala.

aciculina, *Hinds.*
aculeata, *Sow.*
alata, *Sow.*
albolineata, *Sow.*
ambigua, *Linn.*
aurita, *Sow.*
bulbulus, *Sow.*
bullata, *Sow.*
Catanuensis, *Sow.*
concinna, *Sow.*
crassa, *Sow.*
creberrima, *Hinds.*
curvilineata, *Sow.*
denticulata, *Sow.*
dubia, *Sow.*
Elenensis, *Sow.*
Essingtoniensis, *Gray.*
eximia, *Adams and Reeve.*
fasciata, *Sow.*
fragilis, *Hanley.*
friabilis, *Sow.*
Georgettina, *Kien.*
glabrata, *Hinds.*
gracilenta, *Say.*
gracilis, *Sow.*
gradata, *Hinds.*
immaculata, *Sow.*
imperialis, *Sow.*
inconspicua, *Sow.*
indistincta, *Sow.*
irregularis, *Sow.*
lactea, *Krauss.*
laxata, *Sow.*
ligata, *C. B. Adams.*
lineata, *Say.*
lineolata, *Kien.*
maculosa, *Adams and Reeve.*
marmorata, *Sow.*
Mindoroensis, *Sow.*
mitræformis, *Sow.*
multicostata, *Sow.*
multilirata, *Say.*
muricata, *Kien.*
neglecta, *Adams and Reeve.*
Novangliæ, *Couth.*
obesa, *Sow.*
obliqua, *Sow.*
obtusa, *Sow.*
Pallasii, *Sow.*
Philippinarum, *Sow.*

polita, *Sow.*
porrecta, *Hinds.*
principalis, *Pallas.*
pulcherrima, *Sow.*
replicata, *Sow.*
rubrolineata, *Sow.*
scalaris, *Linn.*
similis, *Sow.*
striata, *Gray.*
subtilis, *Sow.*
sulcata, *Sow.*
tenuicostata, *Sow.*
texturata, *Gould.*
trifasciata, *De Haen.*
turricula, *Sow.*
venosa, *Sow.*
vestalis, *Hinds.*

Sub-gen. CLATHRUS, Oken.

Shell turreted, thick, solid, whorls united, with numerous thick, longitudinal varices; aperture ovate, effuse anteriorly; umbilicus concealed, not pervious.

angulata, *Say.*
clathrus, *Linn.*
connexa, *Sow.*
Eschrichti, *Holb.*
fusca, *Sow.*
Grœnlandica, *Chem.*
hexagona, *Sow.*
lamellosa, *Lam.*
Ochotensis, *Midd.*
ovalis, *Sow.*
pyramidalis, *Sow.*
tenuis, *Sow.*
Trevelyana, *Leach.*
Turtonis, *Risso.*
unifasciata, *Sow.*

Sub-gen. OPALIA, H. and A. Adams (Clathrus, *Gray*, not *Oken*).

Shell turreted, imperforate; whorls not disunited, the last with a conspicuous spiral ridge round the umbilical region.

australis, *Lam.*
coronata, *Lam.*
crassicostata, *Sow.*
Diana, *Hinds.*
monocycla, *Kien.*
statuminata, *Sow.*
undulata, *Sow.*
vulpina, *Hinds.*

Sub-gen. AMÆA, H. and A. Adams.

Shell turreted, thin; whorls united, cancellated, with a few thin, irregular varices; aperture semilunar; inner lip gibbose in the middle; outer lip thin, simple.

magnifica, *Sow.* Martinii, *Wood.*

Genus CIRSOTREMA, Mörch.

Shell turreted, solid; whorls cancellated, with a few thick, irregular varices; aperture circular; outer lip with a thick, crenate, marginal varix.

Ex. C. varicosa, *Lamarck*, pl. 23, fig. 9. Operculum, C. varicosa, fig. 9, *a*, 9, *b*.

The shells of this genus may be known from those of *Scala* by the peculiar cancellated structure of the whorls, and by the varices being fewer and non-continuous.

Species of Cirsotrema.

bicarinata, *Sow.*
cochlea, *Sow.*
crassilabrum, *Sow.*
crenata, *Linn.*
decussata, *Lam.*
diadema, *Sow.*
granulosa, *Quoy and Gaim.*
hyalina, *Sow.*
raricostata, *Lam.*
suturalis, *Hinds.*
unifasciata, *Sow.*
varicosa, *Lam.*

Fam. TEREBRIDÆ.

Teeth and lingual membrane rudimentary or none. Tentacles very small or wanting; eyes on the tips of ten-

tacles or wanting. Mantle enclosed, with an elongated siphon. Foot small.

Operculum annular, nucleus apical.

Shell dense, solid, turreted; aperture with an oblique notch in front; outer lip thin, not variced.

Sub-fam. TEREBRINÆ.

Operculum ovate, pointed, with nucleus apical.

Genus ACUS, Humphrey.

Eyes on the tips of the tentacles.

Shell subulate, whorls numerous, simple; aperture elongate, emarginate anteriorly, not produced into a canal; columella simple, incurved, not tortuous; outer lip simple, acute, without a sinus at the fore part.

Syn. Subula, *Schum.* Terebraria, *Rafin.* Turricula, *Hermans.*

Ex. A. maculata, *Linnæus,* pl. 24, fig. 1. Operculum, A. crenulata, *Lamarck,* fig. 1, *a*, 1, *b*. Shell, A. maculata, fig. 1, *c*.

In this genus the tentacles are very short, with the eyes at their tips.

Species of Acus.

albida, *Gray.*
cærulescens, *Lam.*
casta, *Hinds.*
chlorata, *Lam.*
cingulata, *Kien.*
crenulata, *Lam.*
dimidiata, *Linn.*
duplicata, *Linn*
Dusumieri, *Kien.*
eburnea, *Hinds.*
fatua, *Hinds.*
hastata, *Gmel.*
laurina, *Hinds.*
maculata, *Linn.*

muscaria, *Lam.*
nitida, *Hinds.*
plumbea, *Quoy.*
raphanula, *Lam.*
Senegalensis, *Lam.*
strigata, *Sow.*
stylata, *Hinds.*
tigrina, *Gmel.*
varicosa, *Hinds.*

Sub-gen. ABRETIA, H. and A. Adams.

Whorls longitudinally ribbed; columella simple, straight, produced anteriorly; outer lip not sinuated at the fore part.

cerithina, *Lam.*
fictilis, *Hinds.*
lepida, *Hinds.*
mera, *Hinds.*
nassoides, *Reeve.*
pygmæa, *Hinds.*
tenera, *Hinds.*

Sub-gen. HASTULA, H. and A. Adams.

Whorls smooth; columella simple, straight, produced anteriorly; outer lip simple, not sinuated at the fore part.

albula, *Mke.*
anomala, *Gray.*
cinerea, *Born.*
cuspidata, *Hinds.*
inconstans, *Hinds.*
lanceata, *Lam.*
lævigata, *Gray.*
luctuosa, *Hinds.*
penicillata, *Hinds.*
rustica, *Hinds.*
spectabilis, *Hinds.*
strigillata, *Linn.*
venosa, *Hinds.*

Sub-gen. EURYTA, H. and A. Adams.

Shell turreted, subfusiform, smooth, whorls nodosely plicate, the last rather ventricose; columella spirally twisted, forming a false umbilicus pervious to the apex of the spire, much produced anteriorly; aperture somewhat effuse.

aciculata, *Lam.*
Consentini, *Phil.*
fulgurata, *Phil.*
granulosa, *Lam.*

Genus TEREBRA, Adanson.

Eyes at the outer bases of the tentacles.

Shell elongately subulate, whorls very numerous, with a spiral groove forming a posterior band; aperture very small, canaliculated; columella tortuous; outer lip sinuated anteriorly.

Syn. Terebrum, *Montf.*

Ex. T. subulata, *Linnæus*, pl. 22, fig. 2. Operculum, T. subulata, fig. 2, *a*, 2, *b*. Shell, T. subulata, fig. 2, *c*.

The tentacles in this genus are very small, with the eyes at their outer bases.

Species of Terebra.

alveolata, *Hinds.*
amanda, *Hinds.*
Argus, *Hinds.*
Babylonia, *Lam.*
castanea, *Kien.*
cingulifera, *Lam.*
commaculata, *Gmel.*
consors, *Hinds.*
conspersa, *Hinds.*
copula, *Hinds.*
corrugata, *Lam.*
flammea, *Lam.*
frigata, *Hinds.*
funiculata, *Hinds.*
gemmulata, *Kien.*
ligata, *Hinds.*
lingualis, *Hinds.*
monilis, *Quoy.*
nebulosa, *Hinds.*
oculata, *Lam.*
ornata, *Gray.*
pertusa, *Born.*
plicata, *Gray.*
pretiosa, *Reeve.*
robusta, *Hinds.*
rudis, *Gray.*
specillata, *Hinds.*
straminea, *Gray.*
subulata, *Linn.*
succinea, *Hinds.*
tessellata, *Gray.*
tricolor, *Sow.*
triseriata, *Gray.*

Sub gen. MYURELLA, Hinds.

Whorls furnished posteriorly with a tuberculated zone, anteriorly transversely sculptured, or, very rarely, smooth; columella tortuous and produced anteriorly.

affinis, *Gray.*
albicostata, *Adams and Reeve.*
armillata, *Hinds.*
aspera, *Hinds.*
buccinata, *Hinds.*
bifrons, *Hinds.*
cælata, *Adams and Reeve.*
cancellata, *Quoy.*
columellaris, *Hinds.*
elata, *Hinds.*
fenestrata, *Hinds.*
flava, *Gray.*
glauca, *Hinds.*
intertincta, *Hinds.*
larvæformis, *Hinds.*
picta, *Hinds.*
pulchra, *Hinds.*
radula, *Hinds.*
roseata, *Adams and Reeve.*
serotina, *Hinds.*
torquata, *Adams and Reeve.*
tuberculosa, *Hinds.*
undulata, *Gray.*
variegata, *Gray.*
violascens, *Hinds.*

Sub-fam. PUSIONELLINÆ.

Operculum semi-ovate, nucleus small, in the middle of the straight inner edge. Shell smooth, porcellanous.

Genus PUSIONELLA, Gray.

Shell fusiform or oblong-ovate, solid, smooth, porcellanous; aperture contracted anteriorly; columella keeled, twisted in front; canal slightly recurved, short.

Syn. Netrum, *Phil.*

Ex. P. Nifat, *Adanson*, pl. 24, fig. 3. Operculum, P. buccinata, *Lamarck*, fig. 3, *a*, 3, *b*.

The shells in this genus are mostly polished and present a porcellanous appearance; the operculum is very peculiar.

Species of Pusionella.

aculeiformis, *Lam.*
albocincta, *Petit.*
buccinata, *Lam.*
candida, *Phil.*
Catelini, *Petit.*
grandis, *A. Adams.*
lirata, *A. Adams.*
Nifat, *Adans.*
Reclusiana, *Petit.*
subgranulata, *Petit.*

Fam. PYRAMIDELLIDÆ.

Tongue unarmed, teeth none or rudimentary. Tentacles broad, folded, ear-shaped, connate at the base, bearing the eyes immersed at their inner sides. Mantle enclosed, with a rudimentary siphonal fold. Foot produced and truncate anteriorly, with a fold or mentum in front.

Operculum horny, subspiral, with the columellar margin sinuated.

Shell turreted; aperture entire or not produced into a canal in front; columella plaited.

The species of this group are all marine, and, from the circumstance of their possessing a retractile proboscis, are probably predacious and carnivorous in their habits.

Genus PYRAMIDELLA, Lamarck.

Shell turreted, many-whorled, longitudinally ribbed; spire elevated, nucleus sinistral; aperture obovate, somewhat produced and channelled in front; columella curved, with three or more oblique plaits; outer lip acute.

Syn. Pyramidellus, *Montf.*

Ex. P. auris-cati, *Chemnitz*, pl. 24, fig. 4, 4, *a*. Operculum, P. auris-cati, 4, *b*, 4, *c*. Shell, P. auris-cati, fig. 4, *d*.

The *Pyramidellæ* live in sandy bays and on shallow mud-banks, concealing themselves under the surface, and indicating their presence by the formation of slender, raised tracks; they are found in the Eastern Archipelago, New Holland, and the Mauritius.

Species of Pyramidella.

acicula, *A. Adams.*
aclis, *A. Adams.*
ambigua, *Phil.*
auris-cati, *Chem.*
corrugata, *Lam.*
glans, *Reeve.*
gracilis, *A. Adams.*
magnifica, *Adams and Reeve.*
metula, *A. Adams.*
minuta, *Phil.*
mitralis, *A. Adams.*
nitida, *A. Adams.*
nodicincta, *A. Adams.*
propinqua, *A. Adams.*
subulata, *A. Adams.*
variegata, *A. Adams.*

Genus OBELISCUS, Humphrey.

Shell subulate, turreted, many-whorled, smooth; spire pointed, nucleus sinistral; aperture semi-oval, entire, rounded anteriorly; columella straight, plicated; outer lip acute.

Ex. O. punctatus, *Chemnitz*, pl. 24, fig. 5. Operculum, O. dolabratus, *Linnæus*, fig. 5, *a*. Shell, O. dolabratus, fig. 5, *b*.

This genus differs from *Eulimella* in the plicated pillar, from *Pyramidella* in not being longitudinally ribbed, and from the other members of the family in its tapering, subulate form, and the plaits on the columella. Many extinct species, referred to certain genera, may possibly be found to belong to this type, which appears to have been well represented, and to have comprised

species of larger dimensions in past epochs than in the present time; examples occur even in the oldest fossiliferous strata.

Species of Obeliscus.

aciculatus, *A. Adams.*
acutus, *A. Adams.*
annulatus, *A. Adams.*
attenuatus, *A. Adams.*
balteatus, *A. Adams.*
brunneus, *A. Adams.*
cinctus, *Reeve.*
clavulus, *A. Adams.*
conicus, *C. B. Adams.*
dolabratus, *Linn.*
elegans, *A. Adams.*
fastigium, *A. Adams.*
gracilis, *Brocc.*
hastatus, *A. Adams.*
metula, *A. Adams.*
monilis, *A. Adams.*
perforatus, *A. Adams.*
pulchellus, *A. Adams.*
punctatus, *Chem.*
pusillus, *A. Adams.*
scitulus, *A. Adams.*
spiculum, *A. Adams.*
striatulus, *A. Adams.*
stylinus, *A. Adams.*
sulcatus, *A. Adams.*
terebelloides, *A. Adams.*
terebellum, *Müll.*
teres, *A. Adams.*
tessellatus, *A. Adams.*
turritus, *A. Adams.*
ventricosus, *Guerin.*

Genus TURBONILLA, Risso.

Operculigerous lobe with a minute, conical appendage on each side.

Shell slender, elongated, many-whorled, longitudinally ribbed; apex of spire with a persistent, embryonic, sinistral nucleus; aperture oblong or subquadrate, peristome incomplete; columella straight, simple, edentulate, and without a plait.

Syn. Chemnitzia, *D'Orb.* Pyrgiscus, *Phil.* Orthosteles, *Arad. and Mag.*

Ex. T. scalaris, *Philippi*, pl. 24, fig. 6. Shell, T. lactea, *Linnæus*, fig. 6, *a*.

This genus comprises a great number of small and extremely beautiful shells, which have the whorls longitudinally ribbed or cancellated, and the inner lip simple and toothless.

Species of Turbonilla.

acicularis, *A. Adams.*
aculeus, *C. B. Adams.*
acuminata, *C. B. Adams.*
affinis, *C. B. Adams.*
bisuturalis, *Say.*
Boholensis, *A. Adams.*
candida, *A. Adams.*
clathrata, *Jeffr.*
clathratula, *C. B. Adams.*
communis, *C. B. Adams.*
concinna, *A. Adams.*
cornea, *A. Adams.*
dealbata, *Stimp.*
excavata, *Phil.*
exilis, *C. B. Adams.*
fenestrata, *Jeffr.*
flavocincta, *C. B. Adams.*
formosa, *Jeffr.*
fusca, *C. B. Adams.*
gracilior, *C. B. Adams.*
grandis, *Adams and Reeve.*
Gulsonæ, *Clark.*
impressa, *Kutz.*
indistincta, *Mont.*
interrupta, *Totten.*
Kraussii, *H. and A. Adams* (lactea, *Krauss*).
lactea, *Linn.*
lævis, *C. B. Adams.*
latior, *C. B. Adams.*
major, *C. B. Adams.*
marginata, *C. B. Adams.*
modesta, *Stimp.*
multicostata, *C. B. Adams.*
nivea, *Stimp.*
obeliscus, *C. B. Adams.*
Panamensis, *C. B. Adams.*
producta, *C. B. Adams.*
puncta, *C. B. Adams.*
pusilla, *C. B. Adams.*
reticulata, *C. B. Adams.*
rufa, *Phil.*
scalaris, *Phil.*
seminuda, *C. B. Adams.*
similis, *C. B. Adams.*
striosa, *C. B. Adams.*
substriata, *C. B. Adams.*
subulata, *C. B. Adams.*
trifida, *Totten.*
trilineata, *A. Adams.*
turris, *D'Orb.*
turrita, *C. B. Adams.*
varicosa, *A. Adams.*

Genus ODOSTOMIA, Fleming.

Operculigerous lobe simple.

Shell turreted, subulate or ovate, smooth or transversely striated; apex of spire sinistral; aperture ovate, peristome not continuous; columellar lip with a single tooth-like fold.

Syn. Turbonilla, *b*, *Lovén.*

Ex. O. spiralis, *Montagu*, pl. 24, fig. 7. Shell, O. unidentata, *Montagu*, fig. 7, *a*.

This genus consists of small, usually white, smooth, solid, and enamelled shells, with the inner lip always toothed; they range from low-water to forty fathoms; the animal is the same as that of *Turbonilla*.

Species of Odostomia.

acuta, *Jeffr.*
alba, *Jeffr.*
albella, *Lovén.*
canaliculata, *C. B. Adams.*
conoidea, *Brocc.*
conspicua, *Alder.*
crassa, *Thomp.*
crassula, *H. and A. Adams* (solidula, *C. B. Adams*).
decorata, *Phil.*
doliaris, *Phil.*
dolioliformis, *Jeffr.*
dubia, *Jeffr.*
erythræa, *Phil.*
eulimoides, *Hanley.*
fusca, *C. B. Adams.*
gemmulosa, *C. B. Adams.*
glabrata, *Muhlf.*
nitida, *Alder.*
notata, *Jeffr.*
ornata, *H. and A. Adams* (decorata, *C. B. Adams*).
oscitans, *Lovén.*
ovuloides, *C. B. Adams.*
pallida, *Mont.*
plicata, *Mont.*
rissoides, *Hanley.*
solidula, *Phil.*
striolata, *Alder.*
subulata, *Phil.*
suturalis, *Phil.*
truncatula, *Jeffr.*
turrita, *Hanley.*
unidentata, *Mont.*

Sub.-gen. PARTHENIA, Lowe.

Shell subovate; whorls longitudinally more or less ribbed; columella denticulate or furnished with a plait.

decussata, *Mont.*
excavata, *Phil.*
interstincta, *Mont.*
spiralis, *Mont.*

Sub-gen. AURICULINA, Gray.

Shell ovate, thin, ventricose, whorls simple or concentrically striated; columella edentulate, without a plait.

cylindrica, *Alder.*
diaphana, *Jeffr.*
insculpta, *Mont.*
obliqua, *Alder.*
Warrenii, *Thomp.*

Genus EULIMELLA, Forbes.

Shell elongated, of many whorls, solid, smooth, polished; apex of spire with a persistent, embryonic, sinistral shell; aperture subquadrate, peristome incomplete; columella straight, not plicate or toothed.

Ex. E. Scillæ, *Scacchi*, pl. 24, fig. 8. Shell, E. Scillæ, fig. 8, *a*.

The animal of *Eulimella* resembles that of *Turbonilla;* the shell may be known from *Pyramidella* and *Obeliscus* by the simple, straight columella, and from *Turbonilla* in not being ribbed.

Species of Eulimella.

acicula, *Phil.*
affinis, *Phil.*
clavula, *Lovén.*
Scillæ, *Scacchi.*

Genus ACLIS, Lovén.

Operculigerous lobe ample, developed more on the right side, where it is three or four plicated, than on the left, where it forms a single, rounded lobe.

Shell turreted, many-whorled, whorls smooth or spirally striated; aperture oval or rounded; inner lip simple, without plaits or teeth, base often perforated.

Syn. Ebala, *Gray.*

Ex. A. nitidissima, *Montagu,* pl. 24, fig. 9. Shell, A. nitidissima, fig. 9, *a.*

In *Aclis* the foot is linguiform, much produced anteriorly, and the cylindrical tentacles are slightly swollen at their tips; its other characters are similar to those of the other genera in the family. The species are few in number and small, though exceedingly elegant.

Species of Aclis.

acuminata, *Sow.* (Scalaria).
ascaris, *Mont.*
nitidissima, *Mont.*
supranitida, *S. Wood.*
unica, *Mont.*

Genus MONOPTYGMA, J. Lea.

Shell elongated, imperforate, many-whorled, transversely striated; aperture small, entire in front; columellar lip with a single, obscure, winding plait; outer lip simple, acute.

Syn. Monotygma, *Gray.*

Ex. M. albula, *O. Fabricius*, pl. 24, fig. 10. Operculum, M. albula, fig. 10, *a*. Shell, M. striata, *Gray*, fig. 10, *b*.

Möller has described the animal of this genus, which seems to be nearly allied to *Turbonilla* and *Aclis* in the short tentacles with the eyes at their inner bases, rudimentary tongue, and elongate, narrow foot. The shells are of great beauty and delicacy, and resemble, in many respects, greatly-elongated Actæons.

Species of Monoptygma.

amœna, *A. Adams.*
casta, *A. Adams.*
concinna, *A. Adams.*
fulva, *A. Adams.*
granulata, *A. Adams.*
lauta, *A. Adams.*
pura, *A. Adams.*
speciosa, *A. Adams.*
spirata, *A. Adams.*
striata, *Gray.*
stylina, *A. Adams.*
suturalis, *A. Adams.*

Sub.-gen. MENESTHO, Möller (Pyramis, *Couth.*, not *Chem.* or *Schum.*).

Aperture ovate; columellar lip with the plait obsolete or wanting.

albula, *O. Fab.*
striata, *Couth.*

Fam. EULIMIDÆ.

Teeth and lingual membrane rudimentary. Tentacles simple, subulate; eyes sessile at the outer bases of the tentacles. Mantle enclosed, with a rudimentary siphonal fold. Foot linguiform, produced in front, with a bilobed mentum or fold above the front margin; operculigerous lobe developed at the sides into even-edged, unequal expansions or lobes.

Operculum horny, ovate, subspiral.

Shell white, smooth, polished, turreted; aperture entire in front; columella simple.

Genus EULIMA, Risso.

Shell elongated, white, smooth, polished; spire produced, many-whorled, frequently with an interrupted varix on one side, apex acute; aperture oval, pointed behind; inner lip reflected over the pillar; axis imperforate; outer lip thickened internally.

Syn. Pasithea, *J. Lea.* Polyphemopsis, *Portl.* Balcis, *Leach.*

Ex. E. grandis, *A. Adams*, pl. 25, fig. 1. Operculum, E. grandis, fig. 1, *a*, 1, *b*. Shell, E. polita, *Linnæus*, fig. 1, *c*.

The *Eulimæ* crawl with the foot greatly in advance of the head, which is usually concealed beneath the margin of the shell; many of them have distorted shells, the upper whorls being often curved or inclined on one side.

Species of Eulima.

affinis, *C. B. Adams.*
acuta, *A. Adams.*
arcuata, *C. B. Adams.*
articulata, *Sow.*
brevis, *Sow.*
conica, *C. B. Adams.*
Cumingii, *A. Adams.*
cuspidata, *A. Adams.*
distorta, *Desh.*
flexuosa, *A. Adams.*
gracilis, *C. B. Adams.*
grandis, *A. Adams.*
Guildingii, *A. Adams.*
hastata, *Sow.*
iota, *C. B. Adams.*
labiosa, *Sow.*
major, *Sow.*
modicella, *A. Adams.*
nitidula, *A. Adams.*
obesula, *A. Adams.*
oleacea, *Kutz and Stimp.*
polita, *Linn.*

polygyra, *A. Adams.*
porcellana, *A. Adams.*
pusilla, *Sow.*
pyramidalis, *A. Adams.*
recta, *C. B. Adams.*
solidula, *Adams and Reeve.*
subangulata, *Sow.*
teinostoma, *A. Adams.*
tortuosa, *Adams and Reeve.*
vitrea, *A. Adams.*

Genus NISO, Risso.

Shell subulate, turreted, many-whorled, axis perforated; aperture oval, anteriorly angulated; outer lip simple, acute; umbilicus very deep, extending as far as the apex of the spire.

Syn. Bonellia, *Desh.*, not *Rolando.* Janella, *Grat.*, not *Gray.*

Ex. N. terebellum, *Chemnitz*, pl. 25, fig. 2. Operculum, N. brunnea, *Sowerby*, fig. 2, *a*, 2, *b*.

In this genus the axis of the shell is widely umbilicated, and the aperture, besides being angulated, is curiously modified in consequence; there are about seven species known, some of great beauty and rarity.

Species of Niso.

brunnea, *Sow.*
candidula, *A. Adams.*
goniostoma, *A. Adams.*
imbricata, *Sow.*
interrupta, *Sow.*
splendidula, *Sow.*
terebellum, *Chem.*

Genus LEIOSTRACA, H. and A. Adams.

Shell turreted, subulate, flattened, widest from side to side, polished, smooth, semipellucid; sides with a thin varix extending as far as the apex of the spire; aperture

oblong, entire; inner lip distinct, callous, slightly sinuous in the middle; outer lip flexuous.

Ex. L. bilineata, *Alder*, pl. 25, fig. 3. Shell, L. Metcalfei, *A. Adams*, fig. 3, *a*.

The most curious circumstance about the type of this genus is the fact of its being compressed from before backwards, with a varix on each side, as in *Bursa* and *Pythia*.

Species of Leiostraca.

acuta, *Sow.*
bilineata, *Alder.*
bivittata, *H. and A. Adams* (bilineata, *Adams and Reeve*).
fulvocincta, *C. B. Adams.*
Metcalfei, *A. Adams.*
Mindorensis, *Adams and Reeve.*
solitaria, *C. B. Adams.*
subulata, *Donov.*
unilineata, *Adams and Reeve.*
varians, *Sow.*

Fam. STYLIFERIDÆ.

Lingual membrane? Tentacles slender, subulate, simple; eyes sessile at the outer bases of the tentacles. Mantle enclosed. Foot linguiform, forming an elongated anterior lobe, rudimentary behind.

Operculum none.

Shell thin, subulate or subglobose; aperture entire; columella simple.

These singular animals are parasitic in the skins of Star-fishes, burrowing beneath the surface, and producing tumours, often of considerable size.* When removed and placed in water, they do not appear to possess much locomotive power, but extend the tongue-shaped foot and use it as an exploring organ.

Genus STYLIFER, Broderip.

Shell subulate or subglobose, thin, pellucid, smooth, polished, many-whorled; apex of spire produced and styliform, with a sinistral nucleus; aperture subovate, pointed behind, rounded and entire in front; inner lip smooth, arcuated; outer lip, thin, simple.

Syn. Stylina, *Flem.*, not *Lam.* ? Entoconcha, *J. Müll.*

Ex. S. ovoideus, *A. Adams*, pl. 25, fig. 4. Shell, S. subulatus, *Broderip*, fig. 4, *a*.

Although the name *Stylina* of Fleming has the priority, we have adopted the designation of Broderip, because the former name had been already applied by Lamarck to a genus of Zoophytes.

Species of Stylifer.

acicula, *Gould.*
Broderipii, *A. Adams.*
corallinus, *Chem.*
Cumingii, *A. Adams.*
fastigiatus, *A. Adams.*
fulvescens, *A. Adams.*
Mittrei, *Petit.*
ovoideus, *A. Adams.*
solidus, *A. Adams.*
styliferus, *Flem.*
subulatus, *Brod.*

Fam. CERITHIOPSIDÆ.

Animal with a short, broad head; tentacles subulate, obtuse, wide at the base; eyes placed centrally at their origin; mouth with a retractile proboscis, tongue armed with teeth resembling in arrangement those of *Trichotropis.*

Mantle not reflected, furnished with a rudimentary siphonal fold. Foot oblong, subquadrate in front, where it is furnished superiorly with a mentum, grooved for half its length below, the groove terminating in a perforation; operculigerous lobe well developed.

The head is compressed and vertically cloven in front, and the tips of the tentacles are obtuse or very slightly clavate; the eyes are placed rather close together towards the centre of the base of the tentacles.

Genus CERITHIOPSIS, Forbes and Hanley.

Operculum corneous, of concentric elements, nucleus terminal.

Shell turreted, many-whorled, dextral, granulated; aperture subrotund; inner lip broadly reflected; outer lip acute, arcuated and produced anteriorly; aperture anteriorly sinuated; canal short.

Ex. C. tubercularis, *Montagu*; pl. 25, fig. 5. Operculum, C. tubercularis, fig. 5, *a*. Shell, C. tubercularis, fig. 5, *b*.

The characters of this genus are so peculiar as to warrant its forming the type of a distinct family; the nature of the lingual dentition induced the learned authors of the "British Mollusca" to place it with *Cancellaria* and *Trichotropis*, accompanied by the remark that it probably has relations with *Terebra*.

Species of Cerithiopsis.

assimilata, *C. B. Adams.*
clathrata, *A. Adams.*
Emersonii, *C. B. Adams.*
gemmulosa, *C. B. Adams.*

neglecta, *C. B. Adams.*
paupercula, *C. B. Adams.*
punctata, *Phil.*
subulata, *C. B. Adams.*
terebellum, *C. B. Adams.*
terebralis, *C. B. Adams.*
trilineata, *Phil.*
tubercularis, *Mont.*
tuberosa, *Hinds* (Terebra).
turritella, *Quoy.*
vicina, *C. B. Adams.*
virgulosa, *C. B. Adams.*

Sub-gen. ALABA, H. and A. Adams (Rissoa, sp. *C. B. Adams*).

Shell smooth, semipellucid, whorls sometimes with a few, irregular varices; outer lip thin, simple; aperture slightly emarginate anteriorly.

melanura, *C. B. Adams.*
trivaricosa, *C. B. Adams.*

Fam. ARCHITECTONICIDÆ.

Tentacles folded, with the suture below; eyes sessile on the upper surface of their bases. Mantle included; gill-cavity divided by a longitudinal fold. Foot moderate, formed for walking.

Operculum horny, spiral, ovate or circular.

Shell orbicular, more or less depressed and trochiform; axis widely perforated; aperture not pearly within.

The proboscis in this family is retractile, and the tongue, according to the observations of Dr. Gray, is entirely unarmed; the tentacles are laterally folded, and the relations of the animal appear to be more with *Terebridæ* and *Pyramidellidæ*, than with any other family.

Genus ARCHITECTONICA, Bolten.

Operculum ovate, flat, few-whorled.

Shell conical, last whorl angulated at the periphery,

deeply umbilicated, umbilicus wide and spiral, with the margin crenulated; aperture nearly quadrangular, peritreme thin and simple.

Syn. Solarium, *Lam.*, not *Spix.* Physeter, *Humph.*, not *Linn.*

Ex. A. perspectiva, *Linnæus*, pl. 25, fig. 6. Operculum, A. perspectiva, fig. 6, *a*, 6, *b*. Shell, A. perspectiva, fig. 6, *c*.

The ovate, flat, subspiral operculum, and the angulated, trochiform shell, distinguish this genus from *Torinia*. The species are usually from tolerably deep water, and are not littoral in their habits.

Species of Architectonica.

aspera, *Hinds.*
australis, *Chem.*
cancellata, *Krauss.*
discus, *Phil.*
dorsuosa, *Hinds.*
formosa, *Hinds.*
fragilis, *Hinds.*
fuliginosa, *Hinds.*
granulata, *Lam.*
incisa, *Phil.*
lævigata, *Lam.*
maxima, *Phil.*
modesta, *Phil.*
nobilis, *Bolt.*
perdix, *Hinds.*
perspectiva, *Linn.*
picta, *Phil.*
purpurata, *Hinds.*
quadriceps, *Hinds.*

Genus TORINIA, Gray.

Operculum circular, elevated, conical, of many whorls.

Shell orbicular or elevated, last whorl rounded at the periphery, deeply umbilicated, umbilicus moderate; aperture rhombic; outer lip thin, simple.

Syn. Heliacus, *D'Orb.*

Ex. T. infundibuliformis, *Chemnitz*, pl. 25, fig. 7.

Operculum, T. variegata; *Lamarck*, fig. 7, *a*, 7, *b*, 7, *c*. Shell, T. cylindracea, *Chemnitz*; fig. 7, *d*.

This genus is known from *Architectonica* by its elevated, spiral operculum, and by the last whorl of the shell being rounded at the periphery; the operculigerous lobe on the foot of the animal is cup-shaped when the operculum is removed, and the edges are elevated. The species affect deep water, and are very shy and sensitive when observed.

Species of Torinia.

Ægena, *Gould.*
æthiops, *Mke.*
areolata, *Lam.*
bicarinata, *D'Orb.*
cælata, *Hinds.*
cyclostoma, *Mke.*
cylindracea, *Chem.*
dealbata, *Hinds.*
fenestrata, *Hinds.*
fulva, *Hinds.*
infundibuliformis, *Chem.*
nubila, *Mke.*
straminea, *Chem.*
trochoides, *Desh.*
variegata, *Lam.*
virgata, *Hinds.*

Genus PHILIPPIA, Gray.

Operculum flat, orbicular, many-whorled.

Shell discoidal, subconic, smooth; aperture subquadrate, not pearly within; umbilicus wide, the margin crenulated.

Ex. P. lutea, *Lamarck*, pl. 25, fig 8. Operculum, P. lutea, fig. 8, *a*, 8, *b*.

This genus is founded upon the *Solarium luteum* of Lamarck, the animal of which is stated by M. Philippi to resemble that of *Trochus*; the operculum somewhat resembles that of the *Trochidæ*, but until the peculiari-

ties of the animal become better known we prefer to keep the genus here.

Species of Philippia.

hybrida, *Linn.* lutea, *Lam.*

Genus OMALAXIS, Deshayes.

Operculum circular, elevated, many-whorled.

Shell orbicular, discoidal, widely umbilicated, umbilicus keeled; whorls numerous, on the same plane, the last detached from the others, the periphery with one or two keels; aperture small, usually triangular; outer lip acute.

Syn. Bifrontia, *Desh.* Omalaxon, *Agass.* Schizostoma, *Bronn.*, not *Lea.* Euomphalus, *J. Sow.*

Ex. O. Zanclea, *Philippi*, pl. 25, fig. 9, 9, *a*. Operculum, O. Zanclea, fig. 9, *b*.

Living examples of this genus, only known before in a fossil state, have been recently dredged off the coast of Madeira by Mr. Mac-Andrew, who states that the animal is nearly pellucid.

Genus DISCOHELIX, Dunker.

Shell discoidal, greatly depressed, nearly foliaceous, whorls very numerous, on the same plane, rounded or carinated at the periphery, the last not detached; aperture wide, transverse.

Syn. Orbis, *Lea*, not *Schröt.* or *Lacép.*

Ex. D. foliacea, *Philippi*, pl. 25, fig. 10, 10, *a*.

We have been obliged to change the name of this genus, as *Orbis* is already in use as a synonym of *Planorbis*, and is also employed for a genus of Fishes. A living example has been recorded by M. Philippi as existing in the Mediterranean; the other species are Eocine fossils from Alabama in America.

Sub-order TOXIFERA.

Animal provided with a distinct, retractile proboscis, which, in the contracted state, forms a short, conical, annulated protuberance at the bottom of a tubular extension of the veil between the tentacles. Instead of the usual lingual band, covered with short, transparent teeth, as in the tribes of Proboscidifera and Rostrifera, the proboscis is furnished with a fleshy tube having a bundle of subulate, barbed teeth at the end. This tube is extended below, at right angles to the cavity, into a conical prolongation, which is furnished with two series of similar, red, barbed, subulate teeth, directed from the aperture of the proboscis towards the tip of the tube. These teeth are each separately implanted in the fleshy tube; those nearest the mouth are placed in two, rather irregular, parallel rows, but those nearest the tip are more crowded, the lines gradually diverging from each other.

Adanson states that the tubular expansion of the veil serves as an oral sucker to attach the animal to its prey, the armed tube acting, meanwhile, as a powerful boring instrument. In most species it is simple at the edge, but in others, as in *Nubecula tulipa*, it is fringed with cylindrical beards, and is capable of considerable expansion when the animal is alive.

The *Turridæ*, which have similar subulate teeth, but with the veil short and truncate, possibly belong also to this sub-order just established by Dr. Gray, to whom we are indebted for this valuable information.

Fam. CONIDÆ.

Teeth subulate, in two series, on a tubular prolongation of the retractile proboscis, and with a bundle of sharp, subulate teeth at the extremity. Head with a produced tubular veil; tentacles subulate; eyes on bulgings or slight truncatures on the outer side of the tentacles. Mantle enclosed, with an elongate siphon at the fore part. Foot simple, undivided, oblong, with a conspicuous aquiferous pore on the middle of the under surface.

Operculum, when present, ovate or unguiform, with the nucleus apical.

Shell inversely conical; aperture long and narrow; outer lip usually acute, free or notched at the hind part near the suture; inner lip simple.

The great family of Cones, characterised by the peculiar structure of the mouth, no less than by the similarity in the form of the shell, are principally inhabitants of the equatorial seas. Haunting the holes and fissures of rocks, and the labyrinths of coral-reefs, they lead a predatory life, boring into the shells of other mollusks, and sucking the juices from their bodies. In the Asiatic region the species seem greatly to predominate, there being more than one hundred and twenty peculiar to this portion of the globe, while there are but two or three known in Europe, about twenty in Africa, thirty in Australia, and about fifty in America.

Genus CONUS, Linnæus.

Shell conical, tapering regularly; spire short or depressed, many whorled, whorls coronated; aperture linear, narrow, emarginate anteriorly; columella straight, smooth, truncate in front; outer lip thin, acute, notched at the suture.

Syn. Voluta, *Browne*, not *Linn.* Strombus, *Adans.*, not *Linn.* Rhombus, *Montf.* Conulus, *Rafin.*, not *Nardo* or *Fitzing.* Cucullus, *Bolt.* Conarius, *Dum.*

Ex. C. marmoreus, *Linnæus*, pl. 26, fig. 1. Operculum, C. pulicarius, *Hwass*, fig. 1, *a.* Shell, C. marmoreus, fig. 1, *b.*

The Cones inhabit fissures and holes of rocks, and are found from low-water mark to thirty and forty fathoms. They are very numerous and varied in tropical seas, though a few are found in the Mediterranean and at the Cape. They crawl slowly, and are predatory in their habits.

Species of Conus.

fuscatus, *Born.*
imperialis, *Linn.*
marmoreus, *Linn.*
Nicobaricus, *Hwass.*
nocturnus, *Hwass.*
peplum, *Chem.*
proarchithalassus, *Bolt.*
vidua, *Reeve.*
viridulus, *Linn.*
zonatus, *Hwass.*

Sub-gen. STEPHANOCONUS, Mörch.

Spire elevated, concave.

albimaculatus, *Sow.*
aurantius, *Hwass.*
balteatus, *Sow.*
Barbadensis, *Hwass.*

biliosus, *Bolt.*
bœticus, *Reeve.*
brunneus, *Wood.*
Caillaudi, *Jay.*
cardinalis, *Hwass.*
cedo-nulli, *Klein.*
crepusculum, *Reeve.*
distans, *Hwass.*
granifer, *Reeve.*
leucostictus, *Gmel.*
lividus, *Hwass.*
maculiferus, *Sow.*
Magellanicus, *Hwass.*
muriculatus, *Sow.*
mus, *Hwass.*
nebulosus, *Soland.*
oblitus, *Reeve.*
pigmentatus, *Adams and Reeve.*
primula, *Reeve.*
roseus, *Lam.*
Rüppellii, *Reeve.*
rutilus, *Menke.*
speciocissimus, *Reeve.*
sphacelatus, *Sow.*
sugillatus, *Reeve.*
varius, *Linn.*
verrucosus, *Hwass.*

Sub-gen. PUNCTICULIS, Swainson.

Spire slightly elevated; body-whorl ventricose and convex near the margin.

arenatus, *Hwass.*
Ceylonicus, *Chem.*
pulicarius, *Hwass.*
Santieri, *Kien.*

Sub-gen. CORONAXIS, Swainson.

Shell somewhat turbinate; spire elevated, thick, convex.

abbreviatus, *Nutt.*
Africanus, *Meusch.*
Aristophanes, *Ducl.*
Ceylanensis, *Hwass.*
Chaldæus, *Bolt.*
concinnus, *Brod.*
coronatus, *Reeve.*
encaustus, *Kien.*
Hebræus, *Linn.*
liratus, *Reeve.*
miliaris, *Hwass.*
Mindanus, *Hwass.*
minimus, *Linn.*
musicus, *Hwass.*
nanus, *Brod.*
nux, *Brod.*
plumbeus, *Reeve.*
pontificalis, *Lam.*
princeps, *Linn.*
puncturatus, *Hwass.*
pusillus, *Chem.*
scaber, *King.*
sponsalis, *Chem.*
tiaratus, *Brod.*

Sub-gen. CYLINDRELLA, Swainson (not *Pfeiff.*).

Shell conic-cylindrical, generally grooved; spire elevated, concave.

cælatus, *A. Adams.*
Molluccensis, *Chem.*
mucronatus, *Reeve.*
scitulus, *A. Adams.*
sulcatus, *Hwass.*

Genus NUBECULA, Klein.

Shell light, sub-cylindrical; spire short, but pointed at the summit, whorls slightly coronated; aperture effuse, emarginate in front; columella smooth; outer lip with a wide, but not deep notch at the suture.

Syn. Rollus, *Montf.* Utriculus, *Schum.*, not *Brown.* Tuliparia, *Swains.*

Ex. N. tulipa, *Linnæus*, pl. 26, fig. 2. Operculum, N. tulipa, fig. 2, *a*. Shell, N. geographus, *Linnæus*, fig. 2, *b*.

M. Quoy observes of this genus that the foot is very large, and not entirely retractile within the shell, as in other members of the family; the anterior marginal groove conceals a large pore, the aperture of an aquiferous canal; the tubular veil is fringed at the margin, and can sufficiently dilate itself to admit the tip of the little finger into the orifice. The operculum is small, unguiculate, and slightly curved.

Species of Nubecula.

geographus, *Linn.*
intermedia, *Reeve.*
obscura, *Humph.*
tulipa, *Linn.*

Genus DENDROCONUS, Swainson.

Shell heavy, conic or turbinate; spire truncate, whorls numerous; aperture linear, emarginate in front; columella smooth; outer lip thin, notched at the suture.

Ex. D. figulinus, *Linnæus*, pl. 26, fig. 3. Operculum, D. literatus, *Linnæus*, fig. 3, *a*, 3, *b*. Shell, D. figulinus, fig. 3, *c*.

The species of this genus are usually large, dense, heavy shells, with a general uniformity of painting running through them all. We are indebted to Mr. Swainson for the genus, who has so well studied the entire family of Cones, and fully appreciated them as an independent group.

Species of Dendroconus.

betulinus, *Linn.*
figulinus, *Linn.*
genuanus, *Linn.*
glaucus, *Hwass.*
Loroisii, *Kien.*
papilionaceus, *Hwass.*
Prometheus, *Hwass.*
pyriformis, *Reeve.*
Siamensis, *Hwass.*
Suratensis, *Hwass.*

Sub-gen. LITHOCONUS, Mörch.

Shell conic; body-whorl with the margin carinated.

eburneus, *Hwass.*
emaciatus, *Reeve.*
flavidus, *Lam.*
Gruneri, *Reeve.*
literatus, *Linn.*
millepunctatus, *Lam.*
ponderosus, *Beck.*
quercinus, *Hwass.*
suturatus, *Reeve.*
tabidus, *Reeve.*
tessellatus, *Born.*
virgo, *Linn.*

Genus LEPTOCONUS, Swainson.

Shell conical, sometimes striated; spire acute, concave, whorls numerous, the basal whorl deeply notched at the suture; aperture narrow, slightly effuse at the fore part.

Ex. L. raphanus, *Hwass*, pl. 26, fig. 4. Operculum, L. capitaneus, *Linnæus*, fig. 4, *a*, 4, *b*. Shell, L. Amadis, *Chemnitz*, fig. 4, *c*.

M. Quoy observes, speaking of *L. miles*, that the foot is very narrow and the operculum longer than usual, and that the tentacles are slender and the veil pointed at the extremity. The species are extremely numerous, and will probably require further subdivision when more of the animals shall have been made known.

Species of Leptoconus.

aculeiformis, *Reeve.*
acutangulus, *Chem.*
Amadis, *Chem.*
ammiralis, *Linn.*
archon, *Brod.*
arcuatus, *Brod.*
attenuatus, *Reeve.*
Borneensis, *Adams and Reeve.*
cancellatus, *Brug.*
cassis, *Meusch.*
cingulatus, *Lam.*
Clerii, *Reeve.*
commodus, *A. Adams.*
Delessertianus, *Recluz.*
dispar, *Sow.*
echinulatus, *Kien.*
emarginatus, *Reeve.*
eximius, *Reeve.*
flavescens, *Gray.*
floridulus, *Adams and Reeve.*
gradatus, *Gray.*
incurvus, *Sow.*
insculptus, *Kien.*
L'Argilliertii, *Kien.*
lemniscatus, *Reeve.*
lentiginosus, *Reeve.*
leoninus, *Hwass.*
Lorenzianus, *Chem.*
luctificus, *Reeve.*
marchionatus, *Hinds.*
minutus, *Reeve.*
monilifer, *Brod.*
Narcissus, *Lam.*
nobilis, *Linn.*
ochraceus, *Lam.*
Orbignyi, *Ardouin.*

orbitatus, *Reeve.*
papillaris, *Reeve.*
patriciüs, *Hinds.*
Pealii, *Green.*
præcellens, *A. Adams.*
regularis, *Sow.*
scalaris, *Valenc.*
Sieboldii, *Reeve.*
Sowerbii, *Reeve.*
spiculum, *Reeve.*
spurius, *Gmel.*
sticticus, *A. Adams.*
sulciferus, *A. Adams.*
thalassiarchus, *Gray.*
Thomæ, *Gmel.*
tornatus, *Brod.*
victor, *Brod.*
virgatus, *Reeve.*
voluminalis, *Hinds.*
undatus, *Kien.*

Sub-gen. RHIZOCONUS, Mörch.

Shell conic, smooth; spire short, but pointed at the summit; margin of the body-whorl carinated.

ambiguus, *Reeve.*
Blainvillii, *Kien.*
capitaneus, *Linn.*
centurio, *Born.*
classarius, *Hwass.*
coffea, *Gmel.*
daucus, *Hwass.*
ermineus, *Born.*
fulgurans, *Hwass.*
generalis, *Linn.*
gladiator, *Brod.*
hyæna, *Hwass.*
incarnatus, *Reeve.*
leopardus, *Meusch.*
lineatus, *Chem.*
Malaccanus, *Hwass.*
Maldivus, *Hwass.*
miles, *Linn.*
monile, *Hwass.*
mustelinus, *Hwass.*
Nemocamus, *Hwass.*
Orion, *Brod.*
planorbis, *Born.*
pulchellus, *Swain.*
punctatus, *Gmel.*
rattus, *Lam.*
senator, *Linn.*
splendidulus, *Sow.*
Taheitensis, *Hwass.*
trigonus, *Reeve.*
vexillum, *Mart.*
vittatus, *Lam.*

Sub-gen. CHELYCONUS, Mörch (Pionoconus, *Mörch.* Phasmoconus, *Mörch*).

Spire elevated; body-whorl convex.

achatinus, *Chem.*
Adansonii, *Lam.*

ægrotus, *Reeve.*
æmulus, *Reeve.*
alabaster, *Adams and Reeve.*
Algoensis, *Sow.*
anemone, *Lam.*
aplustre, *Reeve.*
aspersus, *Sow.*
aurisiacus, *Linn.*
Aurora, *Lam.*
Bernardi, *Kien.*
Bowinii, *Kien.*
Broderipii, *Reeve.*
bulbus, *Reeve.*
bullatus, *Linn.*
Caledonicus, *Hwass.*
Californicus, *Hinds.*
carinatus, *Swains.*
catus, *Hwass.*
Cecilii, *Kien.*
cerinus, *Reeve.*
cervus, *Lam.*
characteristicus, *Chem.*
cocceus, *Reeve.*
collisus, *Reeve.*
columba, *Hwass.*
concolor, *Sow.*
consors, *Sow.*
conspersus, *Reeve.*
contusus, *Reeve.*
Crotchii, *Reeve.*
Cumingii, *Reeve.*
cuneolus, *Reeve.*
cyanostoma, *A. Adams.*
dealbatus, *A. Adams.*
Deshayesii, *Reeve.*
Dillwynii, *Reeve.*
discrepans, *Sow.*
elongatus, *Chem.*
epistomium, *Reeve.*
erythræensis, *Beck.*
exaratus, *Reeve.*
filamentosus, *Reeve.*
floccatus, *Sow.*
Franciscanus, *Hwass.*
frigidus, *Reeve.*
fucatus, *Reeve.*
fulmen, *Reeve.*
furvus, *Reeve.*
gilvus, *Reeve.*
Grayi, *Reeve.*
Gubba, *Kien.*
gubernator, *Hwass.*
Guinaicus, *Hwass.*
hepaticus, *Kien.*
inæqualis, *Reeve.*
induratus, *Reeve.*
inflatus, *Sow.*
infrenatus, *Reeve.*
inquinatus, *Reeve.*
inscriptus, *Reeve.*
interruptus, *Brod.*
iodostoma, *Reeve.*
Jaimaicensis, *Lam.*
Janus, *Hwass.*
Jukesii, *Reeve.*
Kieneri, *Reeve.*
lachrymosus, *Reeve.*
lacteus, *Lam.*
lautus, *Reeve.*
lignarius, *Reeve.*
Lovéni, *Krauss.*
lugubris, *Reeve.*
lynceus, *Soland.*
maculosus, *Sow.*
Madurensis, *Hwass.*
Magdalena, *Kien.*
magus, *Linn.*
mahogani, *Reeve.*
Mediterraneus, *Hwass.*
melancholicus, *Lam.*

mercator, *Linn.*
Metcalfei, *Reeve.*
monachus, *Linn.*
Mozambicus, *Hwass.*
mutabilis, *Chem.*
nimbosus, *Hwass.*
nitidus, *Reeve.*
nivosus, *Lam.*
ochroleucus, *Gmel.*
papillosus, *Kien.*
parius, *Reeve.*
pastinaca, *Lam.*
pauperculus, *Sow.*
pica, *Adams and Reeve.*
pictus, *Reeve.*
Porto-Ricanus, *Hwass.*
puncticulatus, *Hwass.*
purpurescens, *Brod.*
pygmæus, *Reeve.*
radiatus, *Gmel.*
raphanus, *Hwass.*
regalitatis, *Sow.*
rhododendron, *Couth.*
rivularis, *Reeve.*
rusticus, *Linn.*
sanguinolentus, *Reeve.*
scalptus, *Reeve.*
scitulus, *Reeve.*
sindon, *Reeve.*
spectrum, *Linn.*
stercus-muscarum, *Linn.*
stillatus, *Reeve.*
stramineus, *Lam.*
striatus, *Linn.*
striolatus, *Kien.*
subulatus, *Kien.*
succinctus, *A. Adams.*
terminus, *Lam.*
testudinarius, *Mart.*
Timorensis, *Hwass.*
Tinianus, *Hwass.*
tristis, *Reeve.*
trochulus, *Reeve.*
unicolor, *Sow.*
ustulatus, *Reeve.*
venulatus, *Hwass.*
verulosus, *Hwass.*
zebra, *Lam.*

Genus CYLINDER, Montfort.

Shell sub-conic, smooth; spire elevated, pointed, whorls numerous; body-whorl ventricose, notched at the suture; aperture effuse at the fore part.

Syn. Textilia, *Swains.*

Ex. C. textile, *Linnæus*, pl. 26, fig. 5. Shell, C, textile, fig. 5, *a*.

The species of this genus are very rich in the style of their colouring, and a somewhat similar reticulated kind of pattern runs throughout the entire series; some of them are shells of great rarity as well as beauty, for example, *C. gloria-maris* and *C. omaria.*

Species of Cylinder.

abbas, *Hwass.*
archiepiscopus, *Hwass.*
aulicus, *Linn.*
auratus, *Brug.*
aureus, *Hwass.*
canonicus, *Hwass.*
colubrinus, *Lam.*
crocatus, *Lam.*
Elisæ, *Kien.*
episcopus, *Brug.*
gloria-maris, *Chem.*
legatus, *Lam.*
magnificus, *Reeve.*
Neptunus, *Reeve.*
omaria, *Hwass.*
panniculus, *Lam.*
prælatus, *Hwass.*
pyramidalis, *Lam.*
reticulatus, *Sow.*
rubiginosus, *Kien.*
solidus, *Sow.*
telatus, *Reeve.*
textile, *Linn.*
verriculum, *Reeve.*
vicarius, *Lam.*
Victoriæ, *Reeve.*

Genus HERMES, Montfort.

Shell sub-cylindrical, generally ribbed transversely; spire elevated, obtuse, convex; aperture linear.

Syn. Theliconus, *Swains.*

Ex. H. terebra, *Born*, pl. 26, fig. 6.

The surface of the shell in this genus is rough, ribbed, or granular, and the form is more cylindrical than cone-shaped; the outline of the spire, though elevated, is obtuse; there are between twenty and thirty species, all partaking of the characters common to the genus.

Species of Hermes.

artoptus, *Sow.*
atramentosus, *Reeve.*
australis, *Chem.*
circumcisus, *Born.*
clavus, *Linn.*
coccineus, *Gmel.*
cylindraceus, *Brod.*
dactylosus, *Kien.*

fabula, *Sow.*
festivus, *Chem.*
glans, *Hwass.*
granulatus, *Linn.*
hieroglyphicus, *Ducl.*
luteus, *Brod.*
mitratus, *Hwass.*
nucleus, *Reeve.*
Nussatula, *Linn.*
pertusus, *Hwass.*
spectabilis, *A. Adams.*
strigatus, *Hwass.*
tendineus, *Hwass.*
terebra, *Born.*
vimineus, *Reeve.*
violaceus, *Reeve.*

Genus DIBAPHUS, Philippi.

Shell involute, subcylindrical, covered with a thin epidermis; spire acute; aperture narrow, linear, abruptly truncate in front; columella simple; inner lip none; outer lip thickened, rectilinear, and abbreviate anteriorly.

Ex. D. edentulus, *Swainson*, pl. 26, fig. 7.

The only species of this genus known was considered by Swainson to be a toothless species of his genus *Conælix*, and by Reeve it has been considered a Cone. The general form and truncate columella resemble *Terebellum*, and were it not for the absence of plaits it might be regarded as a *Cylindra*.

Sub-order ROSTRIFERA.

Head moderate, with a more or less elongated, produced, contractile, transversely-annulated rostrum; tentacles subulate, far apart, on the sides of the rostrum. Lingual membrane often very long, extending far into the body of the animal.

The rostrum is only furnished with contractile muscles, and varies in length and shape; in *Struthiolaria* it is very long and conical-subulate, but it is not retractile,

like those of the former sub-orders; the rostrum of the *Strombidæ* is also elongated, but it is always easily known from the retractile proboscis of the former group.

Fam. STROMBIDÆ.

Lingual membrane with seven rows of teeth (3·1·3), the central teeth single, the lateral three on each side, the inner ones tridentate, the outer simple and uncinate. Muzzle produced, longly conical; eyes on thick, elongated peduncles; tentacles on the middle of the eye-pedicels, or none. Mantle with the outer side generally expanded and often lobed. Foot narrow, compressed, used for jumping not walking, divided into a front dilated, and a hind tapering portion.

Operculum ovate and simple, or claw-like and serrated.

Shell with the outer lip changing in form with age; when adult, more or less expanded and deeply notched at the fore part, or stright and simple.

The *Strombidæ* are active, muscular, and pedacious animals, using their opercula as weapons of defence, and progressing by means of successive leaps, which they accomplish by placing the narrow part of the foot under the shell as a lever, and suddenly straightening it, so as to throw the shell forwards. Their eyes are well-developed, having both pupil and iris, the latter often beautifully coloured. The *Strombus gigas* is occasionally used as an article of diet; it sometimes produces pearls, and is extensively employed in the manufacture of cameos and of porcelain.

Sub-fam. STROMBINÆ.

Tentacles on the middle of the eye-pedicels. Foot with the hind part narrow, subcylindrical, elongated. Shell with the outer lip more or less expanded and notched towards the fore part.

The inner mantle-margin is dilated and covers the columellar lip of the shell, ending posteriorly in a lobe; the outer is furnished at the margin with lobate and tapering processes, which vary in their development according to the genus.

Genus STROMBUS, Linnæus.

Right edge of mantle entire.

Operculum unguiculate, with the margin serrated.

Shell ovate or turreted; aperture elongated, narrow, emarginate or with a short canal in front, canaliculated posteriorly; outer lip often lobed and deeply notched in front near the canal.

Syn. Alata (part), *Klein.* Alatus, *Humph.* Cassida, *Linn.* olim, not *Lang.* Lambis, *Bolt.* Conchilium, *Browne.* Pyramea, *Link.* Pugil, *Fabr.*

Ex. S. vittatus, *Linnæus*, pl. 27, fig. 1. Operculum, S. galeatus, *Wood*, fig. 1, *a*, 1, *b*. Shell, S. pugilis, *Linnæus*, fig. 1, *c*.

The *Strombidæ* are often called "Strombs" and "Wing-shells." Owing to the great development of the outer lip, they present a very different appearance in the adult state to that in the young individuals. They are pretty gene-

rally distributed, but by far more numerous in tropical seas than in those of temperate countries.

Species of Strombus.

accipitrinus, *Mart.*
alatus, *Gmel.*
galeatus, *Wood.*
gigas, *Linn.*
Goliathus, *Chem.*
gracilior, *Wood.*
granulatus, *Wood.*
inermis, *Sow.*
laciniatus, *Chem.*
latissimus, *Linn.*
lentiginosus, *Linn.*
papilio, *Chem.*
pugilis, *Linn.*
rosaceus, *Mart.*
Thersites, *Gray.*

Sub-gen. MONODACTYLUS, Klein.

Outer lip with a lobe at the posterior part much produced.

adustus, *Chem.*
aratrum, *Martyn.*
auris-Dianæ, *Linn.*
australis, *Sow.*
costo-muricatus, *Mart.*
gallus, *Linn.*
guttatus, *Mart.*
Peruvianus, *Swains.*
striato-granulatus, *Mart.*
tricornis, *Mart.*

Sub-gen. GALLINULA, Klein.

Inner lip restricted, not spread widely over the body-whorl; posterior canal frequently long, ascending the spire.

Campbellii, *Gray.*
canarium, *Linn.*
columba, *Gmel.*
deformis, *Gray.*
epidromis, *Linn.*
fusiformis, *Sow.*
gibbus, *Mart.*
Japonicus, *Reeve.*
labiosus, *Wood.*
Listeri, *Gray.*
marginatus, *Linn.*
minimus, *Linn.*
pulchellus, *Reeve.*
Sibbaldii, *Sow.*
succinctus, *Linn.*
Swainsoni, *Reeve.*
variabilis, *Swains.*
vittatus, *Linn.*

Sub-gen. CANARIUM, Schumacher (Aporrhais, *Klein*, not *Aldrov.* Strombidea, *Swains.* Strombella, *Schlüt*).

Inner lip restricted; outer lip not dilated; posterior canal short or obsolete.

albus, *Mart.*
bulbulus, *Sow.*
coniformis, *Sow.*
corrugatus, *Adams and Reeve.*
decorus, *Bolt.*
dentatus, *Linn.*
elegans, *Sow.*
erythrostoma, *Chem.*
fasciatus, *Born.*
flosculosus, *Mart.*
gibberulus, *Linn.*
hæmastoma, *Sow.*
Hellii, *Roas.*
Luhuanus, *Linn.*
maculatus, *Nutt.*
plicatus, *Lam.*
rugosus, *Sow.*
Rüppellii, *Reeve.*
scalariformis, *Ducl.*
terebellatus, *Sow.*
urceus, *Linn.*

Genus HARPAGO, Klein.

Outer margin of mantle digitated.

Operculum claw-shaped, with the edge serrated.

Shell turreted, ovate-oblong; aperture elongated, with a long, recurved canal in front, and ending posteriorly in a canal ascending the spire; outer lip thickened, expanded and digitate, with a deep sinus at the fore part.

Syn. Strombus, *Humph.*, not *Linn.* Digitata, *Fabr.* Pteroceres, *Montf.* Pterocera, *Lam.* Pteroceras, *Sow.* Pterocerus, *Thurm.*

Ex. H. lambis, *Linnæus*, pl. 27, fig. 2. Operculum, H. lambis, fig. 2, *a*, 2, *b*. Shell, H. lambis, fig. 2, *c*.

When young, the outer lip of the shell in this genus is simple, the claws gradually appearing in the form of open canals, which afterwards become closed and solid. They are sometimes called "Spider-claws" and "Scorpion-shells," and are principally from the Indian seas.

Species of Harpago.

arthriticus, *Bolt.*
chiragra, *Linn.*

Sub-gen. MILLIPES, Klein.

Outer and inner lips corrugated; digitations of outer lip numerous.

elongatus, *Swains.*
millipeda, *Linn.*
multipes, *Chem.*
pseudo-scorpio, *Lam.*
scorpio, *Linn.*

Sub-gen. HEPTADACTYLUS, Klein.

Outer and inner lips smooth; digitations not numerous.

crocatus, *Link.*
lambis, *Linn.*
radix-bryoniæ, *Gmel.*
Yoldii, *Mörch.*

Genus GLADIUS, Klein.

Outer mantle-margin digitated.

Operculum small, ovate, not serrated.

Shell fusiform; spire elevated; aperture oblong, with a posterior canal running up the spire; beaked in front, the canal more or less produced; outer lip serrated or digitated, sinuated at the fore part.

Syn. Tibia, *Bolt.* Fusus, *Humph.*, not *Klein.* Rostellum, *Montf.* Rostellaria, *Lam.*

Ex. G. fusus, *Linnæus*, pl. 27, fig. 3. Operculum, G. fusus, fig. 3, *a*. Shell, G. fusus, fig. 3, *b*.

The "Spindle-Strombs," as they have been called, are elegant shells, with the fore part produced into a long beak. The animal of the species figured for illustration, is handsomely marked with red and yellow on the head

and muzzle, and is from Borneo; the other species are also from the Indian Archipelago, with the exception of *G. magnus*, which is from the Red Sea.

Species of Gladius.

curtus, *Sow.*
Favanni, *Pfeiff.*
fusus, *Linn.*
magnus, *Chem.*
melanocheilus, *A. Adams.*
Powisii, *Petit.*

Sub-gen. RIMELLA, Agassiz.

Whorls cancellated; beak short.

cancellatus, *Lam.*
crispatus, *Sow.*

Sub-fam. TEREBELLINÆ.

Tentacles none; eyes on the ends of long cylindrical peduncles. Foot with the hind part compressed and ovate, anterior part small and rudimentary. Operculum narrow and claw-like. Shell subulate, with the outer lip simple.

In this sub-family the rostrum is produced, annulated, and deeply grooved beneath; the mantle-margin is entire, dilated anteriorly and folded into a rudimentary siphon in front; posteriorly it is prolonged into a slender filament, which extends into the channelled suture of the spire; the foot is compressed and ovate, with a small, horizontal lobe in front; the operculum is inserted in the hind edge of the compressed foot, and is small, narrow, and three-clawed externally, and furnished internally with a free, fin-like, membranous lobe.

Genus TEREBELLUM, Klein.

Shell elongated, subcylindrical, slightly convoluted; spire prominent, obtuse at the apex, whorls smooth; aperture linear, dilated anteriorly, emarginate in front; inner lip spreading, glabrous; columella straight, truncated, ending in a point; outer lip thin, margin acute, anteriorly truncate.

Syn. Seraphs, *Montf.* Serapis, *Link.* Seraps, *Féruss.* Seraphys, *Gray.* Terebrina, *Rafin.* Lucis and Artopoia, *Gistel.* Terebellopsis, *Leym.*

Ex. T. subulatum, *Chemnitz*, pl. 27, fig. 4. Operculum, T. subulatum, fig. 4, *a*, 4, *b*. Shell, T. subulatum, fig. 4, *c*.

The *Terebellum* lives in rather deep water, and is found in the China Sea and among the islands of the Indian and Philippine Archipelagoes. In its mode of progression it resembles the *Strombi*, rolling the shell over and over, and performing a series of irregular jumps; when first taken from the water it will even leap several inches from the ground. It is extremely shy and sensitive in its habits, poising the shell in a vertical position, and protruding the longer telescope eye (for, singularly enough, one eye-pedicel is longer than the other) from the notch in the front of the shell; it will thus remain perfectly immovable until assured of security, when it begins to roll over and examine the ground with its rostrum.

Fam. CYPRÆIDÆ.

Lingual riband rather long, with seven series of teeth (3·1·3), each row composed of one broad, quadrate, unci-

nated, axile tooth, flanked on each side by three uncinated, hooked laterals; outer lateral teeth conical, entire, or toothed. Head broad, rostrum short; tentacles long and subulate, with the eyes on bulgings at their external bases. Mantle furnished with a siphon, and with large, expanded side-lobes covering the shell; branchial plume single. Foot simple.

Operculum none.

Shell usually polished, the last whorl large, convolute, wholly or partially concealing the others; outer lip greatly inflexed and toothed; inner lip dentate or corrugated.

The mantle-lobes are often externally ornamented with forked or pointed beards or filaments, though sometimes, as in *Trivia*, they are papillose, and occasionally they are smooth and simple; the foot is large and expanded, and often greatly produced behind, and the end of the siphon is frequently fimbriated. In their habits, the Cowries are shy, and crawl slowly; they are nearly all tropical animals, living in warm countries, and as they glide along among the coral-reefs and in the shelter of rocks, with the lateral lobes of their mantles adorned with showy colours, they present to the eye of the Naturalist objects of singular interest and beauty.

Genus CYPRÆA, Linnæus.

Shell ovately cylindrical, polished; spire obsolete, or concealed by enamel; aperture narrow, linear; inner lip denticulated; outer lip greatly inflected, denticulate or crenate.

Syn. Porcellana (part), *Rumph.* Peribolus (young), *Adans.* Cyprea, *Montf.* Cypriarius, *Dum.* Erythræa, *Barrol.*

Ex. C. talpa, *Linnæus*, pl. 28, fig. 1. Shell, C. exanthema, *Linnæus*, fig. 1, *a*.

In *Cypræa* proper, the shell is subcylindrical when adult; varying, however, in form according to the age of the animal; in the very young it is thin, pellucid, and helicoid; it afterwards becomes oliviform; and finally, the outer lip is inflexed and the inner lip dentate, as we observe the species in their adult condition.

Species of Cypræa.

Argus, *Linn.*
asellus, *Linn.*
carneola, *Linn.*
cervina, *Lam.*
cervinetta, *Kien.*
chrysalis, *Kien.*
Clara, *Gask.*
contaminata, *Gray.*
cylindrica, *Born.*
dama, *Perry.*
exanthema, *Linn.*
exusta, *Sow.*
falcula, *Kien.*
felina, *Gmel.*
fimbriata, *Gmel.*
hirundo, *Linn.*
interrupta, *Gray.*
irrorata, *Soland.*
Isabella, *Linn.*
leucodon, *Brod.*
lucida, *Lam.*
microdon, *Gray.*
parvula, *Phil.*
pulchra, *Gray.*
quadrimaculata, *Gray.*
Reevei, *Gray.*
sordida, *Lam.*
tabescens, *Soland.*
talpa, *Linn.*
teres, *Gmel.*
testudinaria, *Linn.*
ursellus, *Gmel.*

Genus ARICIA, Gray.

Shell ovate, dorsally gibbous, flattened at the base, the sides thickened and dilated, polished; spire concealed; aperture narrow, linear; inner lip greatly expanded and callous, dentato-lirate; outer lip dilated, flattened and callous, dentato-lirate.

Ex. A. annulus, *Linnæus*, pl. 28, fig. 2. Shell, A. moneta, *Linnæus*, fig. 2, *a*.

The genus *Aricia* forms a natural group of Cowries characterised by the flattened base of the last whorl, the thickened callous lips, and the gibbous back.

Species of Aricia.

achatina, *Soland.*
annulus, *Linn.*
Arabica, *Linn.*
Arabicula, *Lam.*
arenosa, *Gray.*
bicallosa, *Gray.*
caput-anguis, *Phil.*
caput-serpentis, *Linn.*
histrio, *Linn.*
icterina, *Lam.*
Mauritiana, *Linn.*
moneta, *Linn.*
mus, *Linn.*
obvelata, *Lam.*
punctulata, *Gray.*
rattus, *Lam.*
Scottii, *Brod.*
scurra, *Chem.*
stercoraria, *Linn.*
sulcidentata, *Gray.*
tessellata, *Gray.*

Genus LUPONIA, Gray.

Shell ovately pyriform, ventricose, smooth, polished; spire concealed, often depressed; aperture narrow, linear; inner lip plicato-dentate, the plaits often obsolete posteriorly; outer lip inflexed and crenate.

Syn. Cyprædia, *Swains.*

Ex. L. tigris, *Linnæus*, pl. 28. fig. 3. Shell, L. Algoensis, *Gray*, fig. 3, *a*.

This genus comprises the pyriform Cowries, which usually have a few strong, irregular plaits at the fore part of the columella; many of the rarest species of the Cowry tribe are included in the *Luponia* group.

Species of Luponia.

albuginosa, *Gray.*
Algoensis, *Gray.*
angustata, *Gmel.*
atomaria, *Gmel.*
Aurora, *Soland.*
Boivinii, *Kien.*
camelopardalis, *Perry.*
caurica, *Linn.*
citrina, *Gray.*
clandestina, *Linn.*
cribraria, *Lam.*
Cumingii, *Gray.*
eburnea, *Barnes.*
edentula, *Sow.*
erosa, *Linn.*
esontropia, *Ducl.*
ferruginosa, *Kien.*
fuscodentata, *Gray.*
gangrenosa, *Soland.*
Grayi, *Kien.*
guttata, *Gmel.*
helvola, *Linn.*
Humphreysii, *Gray.*
irina, *Kien.*
Lamarckii, *Ducl.*
lentiginosa, *Gray.*
Listeri, *Gray.*
lynx, *Linn.*
mappa, *Linn.*
miliaris, *Linn.*
nebulosa, *Kien.*
nigropunctata, *Gray.*
ocellata, *Kien.*
onyx, *Linn.*
ovum, *Linn.*
pallida, *Gray.*
pantherina, *Soland.*
picta, *Gray.*
poraria, *Linn.*
princeps, *Gray.*
pulchella, *Swains.*
pyriformis, *Gray.*
pyrum, *Gmel.*
sanguinolenta, *Gmel.*
similis, *Gray.*
Sowerbyi, *Kien.*
spadicea, *Swains.*
spurca, *Linn.*
stolida, *Linn.*
subviridis, *Reeve.*
tigris, *Linn.*
turdus, *Linn.*
undata, *Lam.*
variolaria, *Lam.*
vitellus, *Linn.*
Walkeri, *Gray.*
xanthodon, *Gray.*
ziczac, *Gmel.*
zonata, *Chem.*

Genus CYPRÆOVULA, Gray.

Shell oval, ventricose, surface covered with elevated striæ; aperture narrow, linear; inner lip denticulated; outer lip inflected and transversely striated.

Syn. Cypræova, *Swains.* Cyprovula, *Auct.* Cypreovula, *Flem.* Cypræovulum, *Sow.*, *Jun.*

Ex. C. Capensis, *Sowerby*, pl. 28, fig. 4.

The only recent examples of this genus, characterised by the transversely striated back of the shell, are inhabitants of the Cape; they are rare, and the animal has not hitherto been observed.

Species of Cypræovula.

Adamsonii, *Gray.* Capensis, *Gray.*

Genus TRIVIA, Gray.

Shell oval, rather depressed, surface covered with elevated, transverse ribs or tubercles; spire concealed; aperture narrow; inner lip sulcated; outer lip transversely grooved.

Syn. Coccinella, *Leach*, not *Linn.* Trivea, *Swains.*

Ex. T. Europæa, *Montagu*, pl. 28, fig. 5. Shell, T. Europæa, fig. 5, *a*.

The shells of the *Triviæ* are sometimes covered with transverse, raised ribs across the back, as in *T. Europæa* and *T. pediculus*, and sometimes with elevated tubercles, as in *T. pustulosa;* while in others there are both tubercles and ribs, as in *T. staphylæa.*

Species of Trivia.

acutidentata, *Gask.*
armandina, *Ducl.*
australis, *Lam.*
Beckii, *Gask.*
candidula, *Gask.*
Childreni, *Gray.*
coccinella, *Lam.*
depauperata, *Sow.*

Europæa, *Mont.*
formosa, *Gask.*
globosa, *Sow.*
hordacea, *Kien.*
intermedia, *Kien.*
lathyrus, *Dufr.*
Madagascariensis, *Gmel.*
napolina, *Ducl.*
oniscus, *Lam.*
oryza, *Lam.*
ovulata, *Lam.*
Pacifica, *Gray.*
pediculus, *Linn.*
pilula, *Kien.*
producta, *Gask.*
pulex, *Soland.*
radians, *Lam.*
rosea, *Wood.*
rotunda, *Kien.*
rubinicolor, *Gask.*
sanguinea, *Gray.*
Solandri, *Gray.*
subrostrata, *Gray.*
suffusa, *Gray.*
tremeza, *Ducl.*
vesicularis, *Gask.*

Sub-gen. PUSTULARIA, Swainson.

Shell ovate, depressed; back with elevated tubercles; extremities slightly produced; plaits continued over the lips of the aperture in the form of elevated striæ.

limacina, *Lam.*
nucleus, *Linn.*
pustulata, *Lam.*
staphylæa, *Linn.*

Sub-gen. EPONA, H. and A. Adams.

Shell globose; back smooth, or with elevated tubercles; extremities produced; teeth continued over lips of the aperture in the form of elevated striæ.

annulata, *Gray.*
cicercula, *Gmel.*
globulus, *Linn.*
margarita, *Soland.*

Fam. AMPHIPERASIDÆ.

Teeth on lingual membrane in seven rows (3·1·3), the central teeth triangular, recurved, three-toothed; lateral teeth converging, the inner conical, recurved, the outer

large, broad, ovate, with numerous long, linear, equal, curved digitations on the upper edge.

Mantle-lobes expanded, covering the sides of the shell, bearded externally.

Operculum none.

Shell pointed at each end, smooth, polished, the extremities more or less produced; inner lip without teeth; margin of outer lip inflexed.

Genus AMPHIPERAS, Gronovius.

Mantle-margin simple; foot large, thin, expanded.

Shell ovate, ventricose; aperture narrow, extremities not prolonged into canals; outer lip inflexed and transversely wrinkled; inner lip smooth, simple.

Syn. Conchylium, *Tournef.* Licium, *Humph.* Semiporcellana, *Da Costa.* Birostris, *Fabr.* Ovulus, *Montf.* Ovula, *Brug.* Ovulum, *Sow.*

Ex. A. ovum, *Linnæus*, pl. 28, fig. 6. Shell, A. ovum, fig. 6, *a*.

The shells of this genus are never ornamented with rich or varied colours, like those of the Cowry tribe, but are usually white, pink, pale violet, or yellow, without exhibiting any particular markings or pattern.

Species of Amphiperas.

Adriatica, *Sow.*
angulosa, *Lam.*
brevis, *Sow.*
bulla, *Sow.*
bullulata, *Sow.*
carnea, *Poiret.*
concinna, *Sow.*
dentata, *Sow.*
dorsuosa, *Hinds.*
formosa, *Sow.*
hordacea, *Lam.*
lactea, *Lam.*

marginata, *Sow.*
nubeculata, *Sow.*
ovum, *Linn.*
pyriformis, *Sow.*
striatula, *Sow.*
punctata, *Ducl.*
triticea, *Lam.*
umbilicata, *Sow.*

Genus CALPURNUS, Montfort.

Mantle-margin reflexed, simple, partly covering the shell; foot wide, expanded.

Shell cypræiform, dorsally gibbous, with a circular, depressed line at each extremity, leaving a wart-like tubercle; aperture narrow, linear; inner lip smooth, produced posteriorly into a point as long as the hinder end of the outer lip; outer lip inflexed, dentato-lirate, the ridges extending transversely.

Syn. Cyprælla, *Swains.*

Ex. C. verrucosus, *Linnæus*, pl. 28, fig. 7. Shell, fig. 7, *a.*

The shell of *Calpurnus* is known at once by the peculiar tubercle at each end; it is a solid shell, longitudinally striated; a single species only is known.

Genus CYPHOMA, Bolten.

Shell oblong, ovate, with an obtuse, dorsal, transverse ridge; extremities rounded, not produced into elongated beaks; aperture nearly straight, almost central, contracted behind, effuse in front; inner lip smooth, simple; outer lip inflexed, the margin slightly crenate.

Syn. Ultimus, *Montf.* Carinea, *Swains.* Binovoluta, *Schlüt.*

Ex. C. gibbosa, *Linnæus*, pl. 28, fig. 8.

From the mark on the back of the shell and the po-

lished, callous surface the mantle-margin of the animal is probably dilated into lobes covering the sides of the shell; the transverse elevated ridge is a very peculiar feature in the shell of *Cyphoma*.

Species of Cyphoma.

emarginata, *Sow.*
gibbosa, *Linn.*
intermedia, *Sow.*

Genus VOLVA, Bolten.

Mantle-margin with glandular tubercles; foot narrow, longitudinally folded.

Shell elongately oval, spindle-shaped, ventricose; aperture narrow, with the extremities more or less prolonged into channelled beaks; columella smooth; outer lip reflected, thickened externally.

Syn. Radius, *Montf.* Birostra, *Swains.* Rhizorus, *Montf.*

Ex. V. volva, *Linnæus*, pl. 29, fig. 1. Shell, V. volva fig. 1, *a*.

The foot in this genus is narrow and folded lengthways on itself, being adapted for creeping on the rounded narrow branches of *Gorgoniæ* and corals, on which it is supposed to feed; the animal progresses very slowly, but is tolerably bold in disposition.

Species of Volva.

acicularis, *Lam.*
acuminata, *Sow.*
birostris, *Lam.*
coarctata, *Sow.*
deflexa, *Sow.*
formicaria, *Sow.*
frumentum, *Sow.*
gracilis, *Sow.*

longirostrata, *Sow.*
obtusa, *Sow.*
Philippinarum, *Sow.*
recurva, *Sow.*
secale, *Sow.*
similis, *Sow.*
spelta, *Lam.*
subreflexa, *Sow.*
subrostrata, *Sow.*
volva, *Linn.*

Genus SIMNIA, Risso.

Mantle-margin simple, not tuberculated; foot long, broad, not longitudinally folded.

Shell thin, involute, oblong, subfusiform; aperture expanded, contracted at both ends into short pointed canals; inner lip straight, slightly twisted in front; outer lip simple, acute, arcuated.

Syn. Scymnia, *Leach.* Volva, *Flem.*, not *Bolt.* Calpurna, *Flem.*

Ex. S. patula, *Pennant*, pl. 29, fig. 2. Shell, S. patula, fig. 2, *a.*

The flat foot of the animal, and the thin outer lip of the shell will at once distinguish this genus from the *Volva* of Bolten or *Radius* of Montfort; the margin of the mantle, moreover, is simple, and not furnished with tubercles.

Species of Simnia.

aperta, *Sow.*
patula, *Penn.*
uniplicata, *Sow.*

Fam. PEDICULARIIDÆ.

Lingual membrane with seven series of teeth (3·1·3), the central ones hooked and denticulated, the inner lateral teeth four-cusped, the second and third elongated

and three-spined. Eyes sessile on the outer bases of the tentacles. Mantle enclosed, not produced into a siphon in front. Foot small.

Operculum none.

Shell irregular, parasitic; spire lateral, minute; aperture very wide; outer lip thin, simple.

The curious Mollusk, forming the type of this family, was first discovered by Mr. Swainson on the coast of Sicily, parasitic on coral. The lingual dentition somewhat resembles that of *Trichotropis*, but the shell has more the aspect of *Conchopatella*.

Genus PEDICULARIA, Swainson.

Shell ovate-oblong, surface irregular, radiately ribbed in the young state; spire minute, apex lateral, inclined towards the left side; aperture very wide, channelled in front; inner lip simple; outer lip acute, irregular.

Syn. Thyreus, *Phil.*

Ex. P. Sicula, *Swainson*, pl. 29, fig. 3, 3, *a*.

The only species known is parasitic on Mediterranean corals; in the young state, there are regular, conspicuous ribs, radiating from the spire to the margin of the outer lip; in an examination of an imperfect specimen, we found that the eyes were seen at the outer bases of the tentacles, that the mantle-margin was thickened, and that there was no operculum.

Fam. CANCELLARIIDÆ.

Lingual membrane and teeth none. Rostrum very short; tentacles wide apart, with the eyes on the outer side near their bases. Mantle enclosed, with a rudimentary siphonal fold. Foot small, triangular, simple.

Operculum none.

Shell with the aperture more or less channelled in front; columella plicated.

The animals of this family are remarkable for the simple nature of the oral apparatus, both tongue and teeth being wanting; the head, moreover, does not seem to be elongated, the rostrum being rudimentary.

Genus CANCELLARIA, Lamarck.

Shell oval, cancellated, ribbed or reticulated, last whorl ventricose; aperture oblong, channelled in front; canal short, sometimes recurved; columella with several strong, oblique plaits.

Syn. Cancellarius, *Montf.* Buccinella, *Perry.* Plicaria, *Fabr.*

Ex. C. textilis, *Kiener*, pl. 29, fig. 4. Shell, C. cancellata, *Linnæus*, fig. 4, *a*.

M. Deshayes states that the *Cancellaria* is a vegetable feeder; the genus is remarkable for the elegance and rarity of the shells; it is numerous in species, and is found in the West Indies, China, South America, and the Eastern Archipelago; the species range from low-water to forty fathoms.

Species of Cancellaria.

acuminata, *Sow.*
affinis, *C. B. Adams.*
albida, *Hinds.*
asperella, *Lam.*
australis, *Sow.*
buccinoides, *Sow.*
cancellata, *Linn.*
candida, *Sow.*
chrysostoma, *Sow.*
decussata, *Sow.*
gemmulata, *Sow.*
granosa, *Sow.*
hæmastoma, *Sow.*
lactea, *Desh.*
lævigata, *Sow.*
lyrata, *Adams and Reeve.*
macrospira, *Adams and Reeve.*
nodulifera, *Sow.*
obesa, *Sow.*
ovata, *Sow.*
piscatorum, *Chem.*
pulchra, *Sow.*
reticulata, *Lam.*
rugosa, *Lam.*
scabricula, *Linn.*
semipellucida, *Adams and Reeve.*
similis, *Sow.*
Spengleriana, *Desh.*
undulata, *Sow.*
unidentata, *Sow.*
urceolata, *Hinds.*
ventricosa, *Hinds.*

Sub-gen. TRIGONOSTOMA, Blainville.

Shell ovately conical, widely umbilicated; whorls angulated, longitudinally ribbed; aperture triangular, acuminate in front.

antiquata, *Hinds.*
articularis, *Sow.*
bicolor, *Hinds.*
brevis, *Sow.*
bullata, *Sow.*
contabulata, *Sow.*
costata, *Gray.*
costifera, *Sow.*
crenifera, *Sow.*
crispata, *Sow.*
Cumingii, *Sow.*
excavata, *Sow.*
foveolata, *Sow.*
funiculata, *Hinds.*
goniostoma, *Sow.*
lamellosa, *Hinds.*
littoriniformis, *Sow.*
obliquata, *Lam.*
pygmæa, *C. B. Adams.*
scalarina, *Chem.*
scalata, *Sow.*
semidisjuncta, *Sow.*
spirata, *Lam.*
tenera, *Phil.*
textilis, *Kien.*
trigonostoma, *Lam.*
tuberculata, *Sow.*
Verauxii, *Kien.*

Sub-gen. APHERA, H. and A. Adams.

Shell ovate, not umbilicated; outer lip thickened; inner lip callous, and spread over the body-whorl; aperture effuse in front.

tessellata, *Sow.*

Sub-gen. EUCLIA, H. and A. Adams.

Shell pyriform, not umbilicated; spire very short, whorls smooth; columella with strong, anterior plaits.

bulbulus, *Sow.*
cassidiformis, *Sow.*
pyrum, *Adams and Reeve.*
solida, *Sow.*

Sub-gen. MERICA, H. and A. Adams.

Shell ovate; spire acute, whorls decussated or reticulated; aperture oblong, without an emargination in front; inner lip callous, defined; columella with oblique plaits; outer lip acute, lirate internally.

elegans, *Sow.*
melanostoma, *Sow.*
oblonga, *Sow.*
purpuriformis, *Valenc.*

Sub-gen. NARONA, H. and A. Adams.

Shell ovately fusiform; spire elevated, acute, whorls ribbed and clathrate; aperture oblong, produced anteriorly into a short canal; columella usually with two plaits, the posterior the largest; outer lip crenate.

clavatula, *Sow.*
elata, *Hinds.*
mitræformis, *Sow.*
tæniata, *Sow.*

Sub-gen. MASSYLA, H. and A. Adams.

Shell ovate, turbinate; spire obtuse, whorls transversely striated; aperture contracted and emarginate anteriorly; columella truncate.

corrugata, *Hinds.*

Genus ADMETE, Kröyer.

Shell ovate, thin, covered with an epidermis; spire acute, last whorl ventricose; aperture oval, channelled anteriorly; columella with a few rudimentary folds; outer lip thin, simple, acute.

Ex. A. viridula, *Möller*, pl. 29, fig. 5. Shell, A. viridula, fig. 5, *a*.

The animal resembles that of *Cancellaria*, and there is no operculum on the foot; there are but a few species yet known, though, doubtless, many remain to be discovered in the Northern Seas, where the genus appears to represent *Cancellaria*, in the same manner that *Trophon* represents *Murex*, and *Bela* certain species of *Mangelia*.

Species of Admete.

abnormis, *Gray.*
arctica, *Midd.*
Couthouyi, *Sow.*
viridula, *Möll.*

Fam. TRICHOTROPIDÆ.

Lingual membrane short and broad; teeth in seven series (3·1·3), the central hamate and denticulated, the

lateral curved, the inner one denticulated, the two outer simple. Rostrum broad and short; tentacles wide apart, bearing the eyes on bulgings at the extremities of their lower halves. Mantle enclosed, with a rudimentary siphonal fold. Foot small, simple.

Operculum subannular, ovate, horny, with a sublateral nucleus.

Shell spiral, more or less turbinate; whorls covered with an epidermis; aperture sub-emarginate anteriorly; columella not plicate.

In their dentition, these animals have a strong analogy to *Velutinidæ* and *Naticidæ*, but the head of the animal is furnished with a rostrum; the foot is rather small and simple, and the form of the shell varies considerably, being either imperforate or widely umbilicate, smooth or cancellated, turbinate or turreted. The species are chiefly from the Northern Seas, where they inhabit deep water; a few, however, are from the warmer parts of the globe, as *T. flavidula* and *T. cancellata*.

Genus TRICHOTROPIS, Broderip and Sowerby.

Shell turbinate, or somewhat elevated, thin, more or less distinctly umbilicated, spirally furrowed or cancellated, the ribs often furnished with epidermal fringes; apex of spire acute; aperture pyriform, angulated in front; columella obliquely truncated, canal rudimentary; inner lip flattened, arcuated; outer lip simple, acute.

Syn. Trycophore, *Desh.* Trichotropus, *Less.* Trichopodus, *Sow.*

Ex. T. borealis, *Broderip and Sowerby*, pl. 29, fig. 6.

Operculum, T. borealis, fig. 6, *a*, 6, *b*. Shell, T. bicarinata, *Broderip and Sowerby*, fig. 6, *c*.

There are more than a dozen species, most of them being natives of the Boreal seas; the few from warmer latitudes were dredged from very deep-water.

Species of Trichotropis.

acuminata, *Jeffr.*
Atlantica, *Beck.*
bicarinata, *Brod. and Sow.*
borealis, *Brod. and Sow.*
cancellata, *Hinds.*
clathrata, *A. Adams.*
conica, *Möll.*
dolium, *Petit.*
flavidula, *Hinds.*
inermis, *Hinds.*
insignis, *Midd.*
umbilicata, *Brown.*

Sub-gen. IPHINÖE, H. and A. Adams.

Shell thin; aperture subtrigonal; axis widely and deeply perforated.

ciliata, *Krüger.*
unicarinata, *Sow.*

Fam. APORRHAIDÆ.

Lingual membrane with seven series of teeth (3·1·3), the median hooked, denticulated, the first lateral uncinate, the second and third claw-shaped. Rostrum elongate, tapering; tentacles subulate, bearing the eyes on slight prominences at their external bases. Mantle with the outer margin expanded or lobed, and with a rudimentary siphon in front, bent to the right. Foot small, oblong, simple.

Operculum annular, ovate or pointed, the nucleus small, apical.

Shell with the canal bent to the right; outer lip sinuous, lobed, or digitate.

The rostriform head, sessile eyes, and rudimentary siphon, together with certain peculiarities of the shells, especially obvious in some fossil forms, indicate strong affinities with *Cerithium*, which has induced Professor E. Forbes to include both *Cerithium* and *Aporrhais* in the same family; the simple foot and position of the eyes serve to distinguish these animals from those of *Strombidæ*.

Genus APORRHAIS, Aldrovandus.

Mantle-margin expanded, lobed, or digitate.

Operculum ovate, with subconcentric lamellæ

Shell fusiform; aperture narrow, ending anteriorly in a canal or groove; outer lip dilated with age, expanded, angulately lobed, or thickened.

Syn. Tritonidium, *Müll.* Chenopus, *Phil.*

Ex. A. pes-pelicani, *Linnæus*, pl. 26, fig. 5. Operculum, A. pes-pelicani, fig. 5, *a*, 5, *b*. Shell, A. pes-pelicani, fig. 5, *c*.

There are three species of this genus found on our coasts, and in the Mediterranean, and another is from North America, principally from the banks of Newfoundland.

Species of Aporrhais.

occidentalis, *Beck.*
pes-carbonis, *Brogn.*
pes-pelicani, *Linn.*
Serresianus, *Mich.*

Genus STRUTHIOLARIA, Lamarck.

Mantle with the outer edge simple.

Operculum unguiculate, with the nucleus apical.

Shell oblong-oval; spire acuminated, apex obtuse; aperture with a short canal in front; columella thickened, polished, truncate anteriorly; outer lip thickened and sinuous.

Ex. S. vermis, *Martyn*, pl. 26, fig. 6. Operculum, S. vermis, fig. 6, *a*. Shell, S. papulosa, *Martyn*, fig. 6, *b*.

The species of this genus are not numerous, and are inhabitants of the seas of New Zealand and Australia; the name is derived from the form of the aperture, which is supposed to resemble an ostrich's foot.

Species of Struthiolaria.

canaliculata, *Spengl.*
papulosa, *Martyn.*
scutulata, *Martyn.*
vermis, *Martyn.*

Genus HALIA, Risso.

Shell oblong-ovate, ventricose, thin, polished; spire produced, apex obtuse, papillary; columella curved, truncate anteriorly; outer lip simple, thin, effuse, slightly sinuated near the fore part.

Syn. Pryamus, *Sismonda*. Priamus, *Beck*.

Ex. H. Priamus, *Meuschen*, pl. 26, fig. 7.

The type of this genus is the *Bulla helicoides* of Brocchi, a fossil shell; the only recent species is the one mentioned above, the *Halia Flemingiana* of Macgill-

ivray being founded on a young *Buccinum*. Neither the animal nor operculum are known, but from the circumstance of the surface of the recent and fossil shells being sometimes partly covered by Corallines, and the fossil species occurring with marine shells, it is doubtless an inhabitant of the sea, and has even been stated once to have been procured from the Bay of Naples; the position of the genus in a natural system is, however, difficult to determine until the animal is known; the shell has been called an *Achatina*, a *Bulla*, a *Buccinum*, and a *Bulimus*.

Fam. CERITHIIDÆ.

Lingual membrane long and linear, armed with a single series of median teeth, and three lateral series of hooked, multicuspid uncini (3·1·3); outer lateral teeth conical, curved. Rostrum broad and short; tentacles wide apart, subulate; eyes on short pedicels united to the outer sides of the tentacles. Mantle-margin with a rudimentary siphonal fold in front; gill composed of a single series of plates. Foot broad and short, angulated in front.

Operculum horny, spiral or subspiral.

Shell spiral, many-whorled; aperture more or less channelled in front; outer lip often expanded in the adult.

Sub-fam. CERITHIINÆ.

Operculum ovate or semicircular, of few, rapidly-enlarging whorls.

Shells usually without epidermis, with the aperture more or less beaked, and produced in front.

... Marine.

Genus CERITHIUM, Adanson.

Shell turreted, many-whorled, with indistinct varices; canal produced in front and slightly recurved; columella thickened, with a callosity at the hind part.

Syn. Anas, *Klein*, not *Linn.* Clava, *Humph.* Cerites, *Delameth.* Camillus, *Montf.*

Ex. C. vulgatum, *Bruguière*, pl. 29, fig. 7. Operculum, C. vulgatum, fig. 7, *a*, 7, *b*. Shell, C. vulgatum, fig. 7, *c*.

Some of the species of this genus emit a bright green fluid when molested. *Cerithia* are found in all parts of the world, in the East and West Indies, along the coasts of the Pacific, the Gallapagos Islands, Australia, China, and the Mediterranean.

Species of Cerithium.

Adansonii, *Brug.*
adustum, *Kien.*
algicola, *C. B. Adams.*
alternatum, *Phil.*
armatum, *Phil.*
atratum, *Born.*
balteatum, *Phil.*
Billeheusti, *Petit.*
breve, *Quoy and Gaim.*
breviculum, *Sow.*
carbonarium, *Phil.*
columna, *Sow.*
corallium, *Kien.*
crassilabrum, *Krauss.*
dialeucum, *Phil.*
eburneum, *Brug.*
echinatum, *Lam.*
famelicum, *C. B. Adams.*
ferrugineum, *Say.*
fuscatum, *Costa.*
granosum, *Kien.*
heteroclites, *Lam.*
inflatum, *Quoy.*
irroratum, *Gould.*
lacteum, *Kien.*
lemniscatum, *Quoy.*

litteratum, *Born.*
luctuosum, *Mke.*
maculosum, *Kien.*
moniliferum, *Kien.*
morus, *Lam.*
muscarum, *Say.*
mutabile, *C. B. Adams.*
nigrescens, *Mke.*
nodulosum, *Brug.*
ocellatum, *Brug.*
peloritanum, *Cantr.*
planum, *Anton.*
pulicarium, *Phil.*
punctatum, *Brug.*
rubus, *Martyn.*
rugosum, *Wood.*
Rüppellii, *Phil.*
scabridum, *Phil.*
semiferrugineum, *Lam.*
septemstriatum, *Say.*
suturale, *Phil.*
tuberculatum, *Linn.*
tuberosum, *F. Colum.*
uncinatum, *Gmel.*
variabile, *C. B. Adams.*
variegatum, *Quoy.*
versicolor, *C. B. Adams.*
vulgatum, *Brug.*

Genus VERTAGUS, Klein.

Shell turreted, many-whorled; canal strongly recurved over the back of the last whorl; columella thick, callous, with an oblique plait in the middle.

Syn. Aluco, *Link.* Rhinoclavis, *Swains.*

Ex. V. vulgaris, *Schumacher*, pl. 30, fig. 1. Operculum, V. vulgaris, fig. 1, *a*, 1, *b*. Shell, V. vulgaris, fig. 1, *c*.

This genus differs from *Cerithium*, not only in texture and general appearance, but in the recurved beak at the fore part of the aperture, and in the single, strong, oblique fold in the middle of the columella.

Species of Vertagus.

aluco, *Linn.*
articulatus, *Adams and Reeve.*
asper, *Linn.*
attenuatus, *Phil.*
fasciatus, *Brug.*
gemmatus, *Hinds.*
Guinaicus, *Phil.*
Kochi, *Phil.*

maculosus, *Martyn.*
Martinianus, *Pfeiff.*
pharos, *Hinds.*
pictus, *Wood.*
rugatus, *Martyn.*
semigranosus, *Lam.*
Sinensis, *Gmel.*
Sowerbyi, *Kien.*
subulatus, *Lam.*
tæniatus, *Quoy.*
torulosus, *Linn.*
vulgaris, *Schum.*

Genus COLINA, H. and A. Adams.

Shell elongated, tumid in the middle, many-whorled; whorls rounded, longitudinally ribbed and nodose, transversely striated; aperture oval, produced in front into a short, recurved canal; columella simple, oblique; outer lip expanded; the margin reflexed.

Ex. C. macrostoma, *Hinds*, pl. 30, fig. 2.

In this curious little group the middle whorls of the shell are gibbous, and the last whorl is nearly smooth and somewhat pellucid; the outer lip, moreover, is remarkably dilated and reflexed. The species known are inhabitants of deep water, living in coarse sand among the Philippine Islands, and in the China Sea.

Species of Colina.

macrostoma, *Hinds.*
pupiformis, *A. Adams.*

Sub-fam. POTAMIDINÆ.

Operculum circular, of many whorls.

Shells usually covered with a brown epidermis; the fore part of the aperture more or less channelled, not produced into a beak.

Inhabiting the mouths of rivers, or salt marshes.

Genus BITTIUM, Leach.

Operculigerous lobe with rudimentary expansions on each side, and furnished with a roundish, lanceolate cirrhus (Lovén).

Operculum subcircular, of four volutions.

Shell turreted, many-whorled, granular, often with irregular varices; aperture with a slight canal in front, not produced or recurved; inner lip simple; outer lip acute, not reflexed or expanded.

Ex. B. reticulatum, *Da Costa*, pl. 30, fig. 3. Operculum, B. reticulatum, fig. 3, *a*. Shell, B. reticulatum, fig. 3, *b*.

This genus includes several small northern forms, resembling dextral *Triphores*, and ranging from low-water to eighty fathoms.

Species of Bittium.

elegans, *Blainv.*
gibberulum, *C. B. Adams.*
granarium, *Kien.*
Greenii, *C. B. Adams.*
iota, *C. B. Adams.*
neglectum, *C. B. Adams.*
pulchellum, *C. B. Adams.*
reticulatum, *Da Costa.*
scabrum, *Oliv.*
zebrum, *Kien.*

Genus TRIPHORIS, Deshayes.

Tentacles clavate at the tips, united at their bases by a sinuated veil.

Operculum orbicular, few-whorled.

Shell turreted, sinistral; aperture round, produced anteriorly into a closed, tubular canal, sometimes with a posterior, closed canal.

Syn. Tristoma, *Blainv.* Triphora, *Swains.* Triforis, *Desh.*, olim. Mastonia, *Hinds.*

Ex. T. perversus, *Linnæus*, pl. 30, fig. 4. Shell, T. perversus. fig. 4, *a.*

The species of *Triphoris* are very numerous, and are from deep water; they are inhabitants of the Straits of Malacca, Australia, New Guinea, New Ireland, the West Indies, and the Mediterranean. The third posterior canal is only occasionally present; the sculpture of the whorls is very varied, beautiful, and constant.

Species of Triphoris.

adversus, *Hinds.*
candidus, *Hinds.*
Cateretensis, *Hinds.*
clemens, *Hinds.*
concinnus, *Hinds.*
festivus, *A. Adams.*
granulatus, *Adams and Reeve.*
hilaris, *Hinds.*
labiatus, *A. Adams.*
monilifer, *Hinds.*
nigrofuscus, *A. Adams.*
ornatus, *Desh.*
perversus, *Linn.*
roseus, *Hinds.*
ruber, *Hinds.*
scitulus, *A. Adams.*
speciosus, *Adams and Reeve.*
suturalis, *Adams and Reeve.*
tristoma, *Blainv.*
variegatus, *A. Adams.*
verrucosus, *Adams and Reeve.*
violaceus, *Quoy and Gaim.*
vulpinus, *Hinds.*

Sub.-gen. INO, Hinds.

Shell cylindraceo-subulate, elongate, acuminate.

acutus, *Kien.*
æmulans, *Hinds.*
albidus, *A. Adams.*
alveolatus, *Adams and Reeve.*
asperrimus, *Hinds.*
bilix, *Hinds.*
cancellatus, *Hinds.*
cingulatus, *A. Adams.*
collaris, *Hinds.*
consors, *Hinds.*
corrugatus, *Hinds.*
dextroversus, *Adams and Reeve.*

elegans, *Hinds.*
gemmulatus, *Adams and Reeve.*
gigas, *Hinds.*
maxillaris, *Hinds.*
micaus, *Hinds.*
nodiferus, *Adams and Reeve.*
pagoda, *Hinds.*
pulchellus, *A. Adams.*
pyramidalis, *Adams and Reeve.*
sculptus, *Hinds.*
vestalis, *A. Adams.*
vittatus, *Hinds.*

Sub-gen. SYCHAR, Hinds.

Shell elongated, whorls rounded; apex maxillary.

vitreus, *Hinds.*

Genus LAMPANIA, Gray.

Shell turreted, many-whorled, whorls without varices; aperture ovate, with an emargination in front; inner lip callous, truncated and obtuse anteriorly; outer lip dilated, thickened, and sinuous.

Syn. Batillaria, *Benson.*

Ex. L. zonalis, *Bruguière*, pl. 30, fig. 5. Operculum, L. zonalis, fig. 5, *a*.

In adult, typical specimens the outer lip of *Lampania* is very much dilated, and the fore part of the columella is obtuse and rather callous. The species inhabit mangrove-swamps and mud-flats near the sea, and estuaries of rivers, and are principally from the Chinese Seas.

Species of Lampania.

australis, *Quoy and Gaim.*
Cecilii, *Phil.*
zonalis, *Brug.*

Genus POTAMIDES, Brongniart.

Shell turreted, whorls angulated or coronated; aperture produced in front into a nearly straight canal; outer lip thin, sinuated in the middle.

Syn. Potamida, *Schweigg.* Potamidium, *Flem.* Potomis, *Swains.* Potamis, *Sow., jun.*

Ex. P. ebeninus, *Bruguière*, pl. 30, fig. 6. Operculum, P. ebeninus, fig. 6, *a*, 6, *b*. Shell, P. Pacificus, *Sowerby*, fig. 6, *c*.

The species now existing, most nearly resembling the fossil shells on which this genus is founded, are those we have indicated; they are distinguished by their coronated whorls and their rather straight canal.

Species of Potamides.

ebeninus, *Brug.*
Lamarckii, *Valcue.*
Pacificus, *Sow.*

Genus TYMPANOTONOS, Klein.

Shell turreted, whorls spinulose or muricated; aperture round, with a short anterior canal; columella tortuous; outer lip thin, sinuated, produced towards the fore part.

Syn. Tympanostoma, *Sow.* Potamis, *Swains.*

Ex. T. fuscatus, *Linnæus*, pl. 30, fig. 7. Shell, T. fuscatus, fig. 7, *a*.

In general appearance, the shells of this genus resemble those of *Vibex* of Oken, but the twisted columella and distinct canal of the aperture will at once distinguish them.

Species of Tympanotonos.

alatus, *Phil.*
cingulatus, *Gmel.*
fluviatilis, *Pot. and Mich.*
fuscatus, *Linn.*
macroptera, *Kien.*
radula, *Linn.*

Genus PYRAZUS, Montfort.

Shell turreted, subulate, many-whorled, whorls rugose, transversely sulcate and granular, varices few, indistinct; aperture with a short canal in front; columella with an oblique, spiral callosity in the middle; outer lip dilated and thickened, united at the fore part to the inner lip.

Syn. Terebralia, *Swains.*

Ex. P. palustris, *Linnæus*, pl. 30, fig. 8. Operculum, P. palustris, fig. 8, *a*. Shell, P. palustris, fig. 8, *b*.

The *P. palustris* occurs in great abundance in the salt-marshes of the Eastern Archipelago, and is assiduously collected and eaten by the natives, who roast them and suck the contents of the shell through an aperture made by breaking off the tip of the spire.

Species of Pyrazus.

palustris, *Linn.*
semistriatus, *Bolt.*
sulcatus, *Born.*

Genus TELESCOPIUM, Chemnitz.

Shell pyramidal, turreted, last whorl angulated; aperture subquadrate; columella tortuous, ending anteriorly in a point; outer lip thin, sinuous.

Ex. T. fuscum, *Chemnitz*, pl. 31, fig. 1. Operculum, T. fuscum, fig. 1, *a*. Shell, T. fuscum, fig. 1, *b*.

T. fuscum inhabits the salt-marshes and swampy tracks near the mouths of rivers in the East Indian islands, and their pointed spires may be seen sticking out of the soft mud in incredible numbers; they are so abundant near Calcutta as to be used for burning into lime, being exposed in heaps to the sun to kill the animals; in Borneo they are eaten by the natives in the same manner as *Pyrazus*.

Species of Telescopium.

fuscum, *Chem.* læve, *Quoy and Gaim.*

Genus CERITHIDEA, Swainson.

Eye-pedicels very long and thick, connate with the tentacles nearly to their tips.

Shell turreted, many-whorled; apex of spire more or less decollated, whorls longitudinally ribbed; aperture rounded, slightly emarginate anteriorly; outer lip expanded, with a dilated, thickened margin.

Ex. C. Charbonnieri, *Petit*, pl. 31, fig. 2. Operculum, C. decollata, *Linnæus*, fig. 2, *a*. Shell, C. obtusa, *Lamarck*, fig. 2, *b*.

The *Cerithideæ* are amphibious, crawling on the stones and leaves in the neighbourhood of brackish water in mangrove-swamps, and at the mouths of rivers; during the dry season they close the mouth of the shell with the operculum, and hang, suspended by glutinous threads, to small branches and mangrove roots.

Species of Cerithidea.

ambigua, *C. B. Adams.*
Charbonnieri, *Petit.*
costata, *Lam.*
decollata, *Linn.*
fragilis, *Gray.*
Hegewischii, *Phil.*
iostoma, *Pfeiff.*
Kieneri, *Homb. and Jacq.*
Lafondi, *Mich.*
lineolata, *Kien.*
Montagnei, *D'Orb.*
obtusa, *Lam.*
pulchra, *C. B. Adams.*
scalariformis, *Say.*
servilis, *C. B. Adams.*
Sinensis, *Phil.*
varicosa, *Sow.*

Sub-gen. PIRENELLA, Gray.

Shell turreted; whorls granular, or with irregular ribs and varices; aperture rounded, with a short canal in front; inner lip simple; outer lip thin, sinuated.

bicarinata, *Gray.*
cærulescens, *Metcalfe.*
Caillaudi, *Pot. and Mich.*
cinerascens, *Pau.*
conica, *Blainv.*
Diemenensis, *Quoy.*
Largillierti, *Phil.*
mamillata, *Phil.*

Fam. MELANIIDÆ.

Lingual membrane long and linear; teeth in seven series (3·1·3), the lateral teeth uncinate, multicuspid. Rostrum broad, annulated; tentacles subulate, with the eyes on bulgings at their outer sides. Mantle-margin fringed, with a rudimentary siphonal fold in front; gill composed of rigid, cylindrical plates. Foot broad and short, angulated in front.

Operculum horny, ovate, subspiral.

Shell spiral, turreted, covered with a thick, dark-coloured epidermis; aperture often channelled or emarginate in front; outer lip simple.

These animals are fluviatile, being inhabitants of fresh-water lakes and rivers throughout the warmer parts of the world. The apex of the spire is often eroded by the action of the water in which they live. In the British Islands they only occur as fossils; in the southern States of North America they are numerous, and form peculiar groups; those with the many-whorled operculum appear to abound most in the Old World; in some instances these animals are viviparous.

Sub-fam. MELANIINÆ.

Operculum ovate and subspiral, or subcircular, and of few whorls.

Shell covered with a dark, horny epidermis; aperture usually simple in front, without a distinct notch.

Genus TIARA, Bolten.

Shell ovate; spire and aperture of nearly equal length; whorls coronated with spines or tubercles; aperture ovate, entire in front, pointed behind; inner lip very thin; outer lip simple, acute.

Syn. Spirilla, *Humph.* Melas, *Montf.* Melacantha, *Swains.* Amarula, *Sow., jun.*

Ex. T. amarula, *Linnæus*, pl. 31, fig. 3. Operculum, T. acanthica, *Lea*, fig. 3, *a*, 3, *b*. Shell, T. amarula, fig. 3, *c*.

This group comprises the ovate forms of the *Melaniinæ*, in which the whorls are spinose; they are either smooth and black, covered with a villose epidermis, or transversely striated and variegated.

Species of Tiara.

acanthica, *Lea.*
amarula, *Linn.*
cornuta, *Lea.*
crenularis, *Desh.*
Cybele, *Gould.*
denticulata, *Lea.*
diadema, *Lea.*
orientalis, *A. Adams.*
pagoda, *Lea.*
setosa, *Swains.*
speciosa, *A. Adams.*
thiarella, *Lam.*
villosa, *Phil.*

Sub-gen. PLOTIA, Bolten.

Shell ovate, fusiform; whorls spinose, transversely sulcate; aperture elongate, simple in front.

bellicosa, *Hinds.*
coronata, *V. d. Busch.*
corrugata, *Lea.*
crenulata, *Chem.*
elegans, *Bens.*
furfurosa, *Gould.*
granifera, *Lam.*
granum, *V. d. Busch.*
Herklotzi, *Petit.*
lineata, *Gray.*
mirifica, *A. Adams.*
pugilis, *Hinds.*
scabra, *Lam.*
scabrella, *Phil.*
spinulosa, *Lam.*
tenuis, *Lea.*
Terpsichore, *Gould.*
tetrica, *Gould.*
Winteri, *V. d. Busch.*

Genus MELANELLA, Swainson.

Shell ovate; spire as long as the aperture, whorls smooth or tuberculate; aperture ovate, entire in front, acuminate posteriorly; inner lip thickened; outer lip simple, not produced in front.

Syn. Thiara, *Mühlf.*

Ex. M. glans, *Von dem Busch*, pl. 31, fig. 4. Operculum, M. glans, fig. 4, *h*. Shell, M. Hollandri, *Férussac*, fig. 4, *c*.

This genus comprises the ovate forms of *Melaniinæ* which are not spinose; the head of the animal is furnished with a very broad muzzle, and the margin of the mantle is thickened and crenate.

Species of Melanella.

afra, *Lig.*
crassa, *V. d. Busch.*
glans, *V. d. Busch.*
Hollandri, *Fer.*
siccata, *V. d. Busch.*
zonata, *V. d. Busch.*

Sub-gen. SERMYLA, H. and A. Adams.

Shell mitriform; whorls longitudinally plicate, the last transversely sulcate anteriorly; outer lip sinuated in the middle.

harpula, *Dkr.*
mitra, *Dkr.*
nana, *Lea.*
semicostata, *Phil.*
tornatella, *Lea.*

Genus MELANOIDES, Olivier.

Operculum subcircular, subspiral, of few rapidly-enlarging whorls.

Shell subulate, solid, whorls often nodulous or rugose; aperture subcircular, produced in front; inner lip somewhat callous; outer lip sinuated, thickened, dilated, and produced anteriorly.

Ex. M. Indica, *Eydoux*, pl. 31, fig. 5. Operculum, M. glaphyra, *Morelet*, fig. 5, *a*, 5, *b*. Shell, M. aspera, *Lamarck*, fig. 5, *c*.

The form of the aperture in this genus is rounder than in *Melania*, the inner lip is thickened, the whorls are nodose and striated, and the operculum is subcircular and of few whorls.

Species of Melanoides.

aspera, *Lam.*
circumstriata, *Metcalfe.*
clavus, *Lam.*
coarctata, *Lam.*
corrugata, *Lam.*
cylindracea, *Mouss.*
dactylus, *Lea.*
episcopalis, *Lea.*
erythrostoma, *Quoy.*
glaphyra, *Morel.*
herculea, *Gould.*
infracostata, *Mouss.*
Largillierti, *Phil.*
latebrosa, *Hinds.*
locustris, *Morel.*
nigritina, *Morel.*
Papuensis, *Quoy.*
perfecta, *Mouss.*
polygonata, *Lea.*
pulchra, *V. d. Busch.*
pyramidalis, *Morel.*
pyramidata, *Hinds.*
Reenivardii, *De Haan.*
reticulata, *Lea.*
subnodosa, *Phil.*
tuberculata, *Müll.*
torquata, *V. d. Busch.*
turritella, *Dkr.*
unifasciata, *Mouss.*
varicosa, *Trosch.*
virgulata, *Féruss.*

Genus CERIPHASIA, Swainson.

Shell subfusiform, whorls transversely sulcate, the last angulated; spire acuminated; aperture small, produced in front, with a small groove-like canal at the fore part; outer lip thin, posteriorly sinuated.

Syn. Telescopella, *Gray.*

Ex. C. canaliculata, *Say*, pl. 31, fig. 6.

The shell of *Ceriphasia* is covered with a dark green epidermis, and is more like that of *Io* than any other of this family; it may, however, be distinguished from *Io* by the beak being shorter, and by the whorls being sulcated and not spiny.

Species of Ceriphasia.

acuta, *Lea.*
Alexandrensis, *Lea.*
annulifera, *Conr.*
canaliculata, *Say.*
elongata, *Lea.*
exarata, *Lea.*
Haleiana, *Lea.*
Kirtlandiana, *Lea.*
lugubris, *Lea.*
lutosa, *Gould.*
Ordiana, *Lea.*
regularis, *Lea.*
spurca, *Lea.*
subularis, *Lea.*
sulcosa, *Lea.*
symmetrica, *Hald.*
Vainafa, *Gould.*
Virginica, *Gmel.*

Genus PACHYCHEILUS, Lea.

Operculum suborbicular, of several whorls.

Shell fusiformly conical, smooth, solid; aperture ovate, entire anteriorly; columellar lip thickened posteriorly; outer lip thick.

Ex. P. lævissimus, *Sowerby*, pl. 31, fig. 7. Operculum, P. corvinus, *Morelet*, fig. 7, *a*, 7, *b*.

The chief peculiarity of this genus is the thickened outer lip; it differs from *Melanopsis* in having no sinus at the fore part of the aperture, and from *Melania* in having a callous columella. The operculum has the nucleus subcentral, and is composed of two or three spiral revolutions.

Species of Pachycheilus.

amœnus, *Morel.*
corvinus, *Morel.*
dubiosus, *Say.*
ferrugineus, *Lea.*
graphium, *Morel.*
Indiorum, *Morel.*

La Güáyia, *Sallé.*
lævissimus, *Sow.*
nigritus, *Morel.*
simplex, *Say.*
sulcospira, *Mouss.*
testudinarius, *V. d. Busch.*
verus, *Paz.*
Zanguebarensis, *Petit.*

Sub-gen. AYLACOSTOMA, Spix.

Shell elongately fusiform, thick, solid, whorls smooth, carinated or geniculate near the suture; inner lip thickened, callous; aperture entire in front; outer lip thickened internally.

coarctatus, *Lam.*
cochlidium, *Lea.*
costellaris, *Lea.*
Cumingii, *Lea.*
impurus, *Lea.*
mœstus, *Hinds.*
rectus, *Lea.*
scalaris, *Wagn.*
sobrius, *Lea.*

Sub-gen. POTADOMA, Swainson.

Shell ovate, solid; spire short, whorls smooth; inner lip somewhat thickened; aperture produced in front; outer lip acute, simple.

depygis, *Say.*
fontinalis, *Phil.*
gracilis, *Lea.*
inornatus, *Anthon.*
lævigatus, *Lea.*
Niagarensis, *Lea.*
Ococensis, *Lea.*
ovoideus, *Lea.*
perfuscus, *Lea.*
rufescens, *Lea.*
sordidus, *Lea.*
subcylindraceus, *Lea.*
subsolidus, *Lea.*
Warderianus, *Lea.*

Genus IO, Lea.

Shell fusiform, whorls spinose; aperture large, ovate, dilated anteriorly, produced in front into a grooved beak; outer lip simple, acute.

Syn. Melafusus, *Swains.* Glotella, *Gray.*

Ex. I. fluviatilis, *Say*, pl. 31, fig. 8. Operculum, I. fluviatilis, fig. 8, *a*, 8, *b*.

The species of *Io* inhabit the rivers of North America; the shells, like those of most of the *Melaniidæ*, are covered with a brown, black, or olivaceous epidermis, and are remarkable for the peculiar elongation of the axis anteriorly, and for the spinose nature of the last whorl.

Species of Io.

armigera, *Lea.*
Duttoniana, *Lea.*
Florentiana, *Lea.*
fluviatilis, *Say.*
fusiformis, *Say.*
nobilis, *Lea.*
pagodula, *Gould*
pernodosa, *Lea.*
plicata, *Lea.*
robulina, *Anthon.*
spinigera, *Lea.*
spinosa, *Lea.*
tenebrosa, *Lea.*
tuberculata, *Lea.*

Sub-gen. ELIMIA, H. and A. Adams.

Shell fusiformly ovate; whorls reticulate or nodulose, carinate in the middle; aperture greatly produced anteriorly; outer lip thin, simple, acute.

acuticarinata, *Lea.*
apis, *Lea.*
bella, *Conr.*
Boykiniana, *Lea.*
caliginosa, *Lea.*
cancellata, *Say.*
carinocostata, *Lea.*
catenaria, *Say.*
catenoides, *Lea.*
elevata, *Lea.*
filum, *Lea.*
Holstonia, *Lea.*
nodulosa, *Lea.*
Potosiensis, *Lea.*
spinalis, *Lea.*
torta, *Lea.*

Genus MELANIA, Lamarck.

Shell subulate, elongated; spire many-whorled, acute, whorls smooth, not spinose; aperture ovate, acuminate, posteriorly entire, rounded in front; inner lip thin, not callous; outer lip simple, acute, margin entire.

Syn. Turritella, *Link.*, not *Lam.* Ellistoma, *Rafin.* Melanites, *Krug.* Hygronoma, *Gist.*

Ex. M. hastula, *Lea*, pl. 32, fig. 1. Operculum, M. hastula, fig. 1, *a*, 1, *b*. Shell, M. hastula, fig. 1, *c*.

The species of this genus appear to be peculiar to tropical countries, where they inhabit streams and stagnant waters; the apex of the spire, which is perfect in young individuals, afterwards usually becomes eroded or truncate.

Species of Melania.

aculeus, *Lea.*
acus, *Lea.*
albescens, *Lea.*
angusta, *Phil.*
aspirans, *Hinds.*
australis, *Lea.*
blatta, *Lea.*
canalis, *Lea.*
cancellata, *Bens.*
castanea, *Lea.*
cincta, *Lea.*
costulata, *Lea.*
cuspidata, *Chem.*
erosa, *Less.*
fœda, *Lea.*
flammulata, *V. d. Busch.*
figurata, *Hinds.*
florata, *Hinds.*
fulgurans, *Hinds.*
fumosa, *Hinds.*
funiculus, *Quoy.*
hastula, *Lea.*
hians, *Lea.*
indefinita, *Lea.*
inhonesta, *V. d. Busch.*
juncea, *Lea.*
Liebmanni, *Phil.*
luctuosa, *Hinds.*
Mindorensis, *Lea.*
modesta, *Lea.*
Nicobarica, *Mörch.*
pallida, *Lea.*

perpinguis, *Hinds.*
Philippii, *H. and A. Adams* (picta, *Phil.*).
picta, *Hinds.*
Plutonis, *Hinds.*
porcata, *Jonas.*
rivularis, *Phil.*
rufa, *Lea.*
Scipio, *Gould.*
semicancellata, *V. d. Busch.*
spadicea, *Phil.*
strigosa, *Lea.*
subula, *Lea.*
subularis, *Lea.*
subulata, *Chem.*
Tahitana, *Lea.*
tenebrosa, *Lea.*
terebra, *V. d. Busch.*
terebralis, *Lea.*
teres, *Lea.*
Tirouri, *Féruss.*
turriculus, *Lea.*
uniformis, *Quoy.*
verruculum, *Morel.*

Sub-gen. MELASMA, H. and A. Adams.

Shell solid; spire elevated, whorls smooth, longitudinally plicate; aperture produced anteriorly; inner lip simple, thin; outer lip acute, simple.

blanda, *Lea.*
brevispira, *Anthon.*
clavæformis, *Lea.*
comina, *Conr.*
concinna, *Lea.*
costata, *Quoy.*
costulata, *Lea.*
crebricostata, *Lea.*
Curreyana, *Lea.*
Deshayesiana, *Lea.*
Edgareana, *Lea.*
laqueata, *Say.*
Lecontiana, *Lea.*
nitens, *Lea.*
plicatula, *Lea.*
plicifera, *Lea.*

Genus HEMISINUS, Swainson.

Shell subulate, whorls smooth, simple, numerous; aperture ovate, anteriorly contracted, canaliculate and emarginate in front; outer lip thin, crenulated at the edge.

Syn. Tania, *Gray.* Basistoma, *Lea.*

Ex: H. lineolatus, *Wood*, pl. 32, fig. 2. Operculum, H. lineolatus, fig. 2, *a*, 2, *b*.

This genus comprises many fine species of fresh-water shells, principally from South America, though a few have been regarded as inhabitants of other countries.

Species of Hemisinus.

adspersus, *Trosch.*
Braziliensis, *Moric.*
breviformis, *Phil.*
bulbosus, *Gould.*
contractus, *Lea.*
conus, *Jacq.*
dermestoideus, *Lea.*
Edwardsii, *Lea.*
Guayaquilensis, *Petit.*
Hugelii, *Phil.*
lineolatus, *Wood.*
perfuscus, *Lea.*
ruginosus, *Lea.*
symmetricus, *Conr.*

Genus VIBEX, Oken.

Shell turreted, whorls tuberculated, spirally ridged or muricate; aperture subcircular, produced and broadly channelled in front; outer lip thin, simple.

Syn. Claviger, *Held.* Melania, *Swains.*, not *Lam.*

Ex. V. aurita, *Müller*, pl. 32, fig. 3. Operculum, V. aurita, fig. 3, *a*, 3, *b*. Shell, V. aurita, fig. 3, *c*.

In this genus the shell is usually rather thick and solid, and the columellar lip is somewhat excavated and flattened anteriorly, the whorls, moreover, are usually rough with tubercles or elevated ridges.

Species of Vibex.

aurita, *Müll.*
balteata, *Phil.*
fusca, *Gmel.*
tuberculosa, *Rang.*

Sub-gen. DORYSSA, H. and A. Adams.

Shell subulate, turreted; spire decollated, whorls longitudinally plicate and decussated with transverse ridges; aperture sub-canaliculated in front; outer lip incrassated.

atra, *Richard.*
brevior, *Trosch.*
decollata, *Lea.*
mutans, *Gould.*
subimbricata, *Phil.*
transversa, *Lea.*

Sub-gen. TAREBIA, H. and A. Adams.

Shell ovato-fusiform, whorls granulose or tessellated with nodules; outer lip sinuated towards the hind part; interior of aperture often furnished with spiral grooves.

armillata, *Lea.*
Celebensis, *Quoy.*
coffea, *Phil.*
crenifera, *Lea.*
cribrum, *Lea.*
dembea, *Rüpp.*
flavida, *Dkr.*
granifera, *V. d. Busch.*
lateritia, *Lea.*
lineata, *Trosch.*
lirata, *Mke.*
Luzoniensis, *Lea.*
microstoma, *Lea.*
monozonalis, *Lea.*
pyramis, *V. d. Busch.*
quadriseriata, *Gray.*
Riquetii, *Gratel.*
rudis, *Lea.*
semigranosa, *V. d. Busch.*
suturalis, *Phil.*
tenuis, *Lea.*
tessellata, *Lea.*
turgidula, *Phil.*
verrucosa, *Hinds.*

Sub-gen. JUGA, H. and A. Adams.

Shell thin, whorls rounded, transversely lirate or furnished with elevated transverse lines; aperture produced anteriorly; outer lip simple, acute.

Buddii, *Say.*
circincta, *Lea.*
exilis, *Hald.*
Maluccinosa, *Quoy.*

multilineata, *Say.*
obruta, *Lea.*
occata, *Hinds.*
Proteus, *Lea.*
proxima, *Say.*
Schiedeana, *Phil.*
silicula, *Gould.*
striata, *Lea.*
Troostiana, *Lea.*
virginea, *Say.*

Genus GYROTOMA, Shuttleworth.

Shell ovate, turreted, whorls transversely sulcate; aperture oblong; inner lip thickened, with a posterior callosity; outer lip thin, with a deep, narrow, posterior fissure.

Syn. Schizostoma, *Lea*, not *Bronn.* Melatoma, *Anthony*, not *Swains.* Schizocheilus, *Lea.*

Ex. G. ovoidea, *Shuttleworth*, pl. 32, fig. 4. Operculum, G. ovoidea, fig. 4, *a*, 4, *b*.

The fissure in the outer lip is wanting or obsolete in the sub-genus *Megara*, the species of which, in other respects, closely resemble those of *Gyrotoma* proper. Both groups are American in their geographical distribution.

Species of Gyrotoma.

altilis, *Anthony.*
Babylonica, *Lea.*
Buddii, *Lea.*
conica, *Say.*
constricta, *Lea.*
curta, *Migh.*
curvata, *Say.*
cylindracea, *Migh.*
excisa, *Lea.*
Foremani, *Lea.*
funiculata, *Lea.*
incisa, *Lea.*
laciniata, *Lea.*
ovoidea, *Shuttl.*
pagoda, *Lea.*
pyramidata, *Shuttl.*

Sub-gen. MEGARA, H. and A. Adams.

Shell ovate, solid, whorls transversely sulcate; aperture ovate-oblong, sub-canaliculated anteriorly; outer lip thin, simple, acute.

alveare, *Conr.*
arctata, *Lea.*
auriculæformis, *Lea.*
basalis, *Lea.*
brevis, *Lea.*
crebristriata, *Lea.*
harpa, *Lea.*
Haysiana, *Lea.*
Hoeydei, *Lea.*
impressa, *Lea.*
lateralis, *Lea.*
lima, *Conr.*
oliva, *Lea.*
olivula, *Conr.*
ovalis, *Lea.*
pumila, *Lea.*
solida, *Lea.*
torquata, *Lea.*
undulata, *Say.*
Vanuxemiana, *Lea.*

Genus TRICULA, Benson.

Shell elongately oval; spire produced, apex more or less truncated, last whorl rounded, slightly umbilicated; aperture ovate, entire in front, peritreme continuous, subreflexed.

Ex. T. montana, *Benson*, pl. 32, fig. 5. Operculum, T. montana, fig. 5, *a*, 5, *b*.

The animal of *Tricula* has an elongated proboscis and filiform tentacles with the eyes at their outer bases; in its thickened inner lip, the shell somewhat resembles *Paludomus*, but it is distinguished by its elongated spire and truncated apex; the only species known is an inhabitant of the river Kamaan, in India.

Genus LEPTOXIS, Rafinesque.

Shell ovate or globose, solid, subperforate; spire very short; aperture oval; inner lip with a posterior callosity, often anteriorly callous and produced; outer lip thin, sinuous, with a posterior, ascending canal.

Syn. Anculotus, *Say.* Anculosa, *Swains.* Ancylotus, *Herm.*

Ex. L. prærosa, *Say*, pl. 32, fig. 6. Operculum, L. prærosa, fig. 6, *a*, 6, *b*.

The species of this genus are peculiar to the North-American rivers; the spire of the shell has a truncated, eroded apex, and, in the typical species, the shell is solid and subglobose, with the aperture simple in front.

Species of Leptoxis.

abrupta, *Lea.*
angulata, *Conr.*
crassa, *Hald.*
flammata, *Lea.*
fuliginosa, *Lea.*
fusca, *Hald.*
fusiformis, *Lea.*
gibbosa, *Lea.*
globula, *Lea.*
Griffithsiana, *Lea.*
Hildrethiana, *Lea.*
integra, *Say.*
melanoides, *Conr.*
Nickliniana, *Lea.*
nigrescens, *Conr.*
obtusa, *Lea.*
picta, *Conr.*
pilula, *Lea.*
pisum, *Hald.*
plicata, *Conr.*
prærosa, *Say.*
pumilis, *Conr.*
rubiginosa, *Lea.*
squalida, *Lea.*
subglobosa, *Say.*
tæniata, *Say.*
tintinnabulum, *Lea.*
trivittatus, *De Kay.*
Troostiana, *Lea.*
turgida, *Hald.*
variabilis, *Lea.*
virgata, *Lea.*
viridis, *Lea.*

Sub-gen. NITOCRIS, H. and A. Adams.

Shell thin, subglobose, whorls angulated, often carinate; inner lip subtruncate, or ending in a tubercle.

carinata, *Lea.*
costata, *Lea.*
dentata, *Couth.*
dilatata, *Conr.*
dissimilis, *Say.*
ebena, *Lea.*
inflata, *Lea.*
Kirtlandiana, *Anthon.*
monodontoides, *Gould.*
occidentalis, *Lea.*
Rogersii, *Conr.*
subcarinata, *Hald.*

Sub-gen. VERENA, H. and A. Adams.

Shell subturbinate, whorls transversely lirate, carinated at the hind part; aperture not produced in front; inner lip simple, without a posterior callus; columella subtruncate anteriorly, forming a very short canaliculation.

crenocarina, *Morel.*

Sub-gen. LYTHASIA, Lea.

Shell thick, solid, ovate, whorls gibbose or tuberculated at the hind part; aperture sub-canaliculated and produced in front; inner lip with a callus posteriorly, subtruncate anteriorly.

genicula, *Hald.*
neritiformis, *Desh.*
obovata, *Say.*
salebrosa, *Conr.*
semigranulosa, *Desh.*

Genus PYRGULA, Christie and Janson.

Shell turreted, whorls numerous, carinated; aperture oval, emarginate anteriorly; columellar lip free, reflected, produced in front; outer lip thin, simple.

Ex. P. Helvetica, *Michelin*, pl. 32, fig. 7.

The curious little shell on which this genus is founded inhabits the fresh-water streams of Switzerland, and is remarkable for its white colour and the carinated nature of the whorls.

Sub-fam. MELANOPSINÆ.

Operculum ovate, subspiral.

Shell covered with an epidermis; aperture with a distinct notch in front.

Genus MELANOPSIS, Férussac.

Shell ovate, last whorl elongated, smooth, or longitudinally plicate; spire short, acute; aperture oblong, distinctly notched in front; inner lip thick, with a callus posteriorly; outer lip simple, acute.

Syn. Faunus, *Megerle*, not *Montf.* Campeloma, *Rafin.* Ceneona, *Gist.*

Ex. M. costata, *Olivier*, pl. 32, fig. 8. Operculum, M. prærosa, *Linnæus*, fig. 8, *a*, 8, *b*.

This genus was established by Férussac for the species of *Melaniidæ* which have the columellar lip callous, and a notch at the fore part of the aperture; it is distinguished from *Faunus* in the outer lip not being produced and sinuated, and in the general form of the shell.

Species of Melanopsis.

acicularis, *Féruss.*
denegabilis, *Féruss.*
Esperi, *Féruss.*
maculata, *Lea.*
prærosa, *Linn.*
trifasciata, *Gray.*
variabilis, *V. d. Busch.*
Zealandica, *Gould.*

Sub-gen. CANTHIDOMUS, Swainson.

Spire generally short, whorls coronated with spines, or marked with longitudinal ribs, the last obtuse anteriorly.

cariosa, *Linn.*
costata, *Oliv.*
Helena, *Modeer.*
Kotschyi, *V. d. Busch.*
Parreyssii, *Mühlf.*
Theminckiana, *Petit.*
tigris, *Féruss.*

Sub-gen. LYRCEA, H. and A. Adams.

Shell ovately fusiform, whorls transversely sulcate; inner lip with a large, posterior callus; columella subtruncate anteriorly; aperture canaliculated posteriorly.

Dufourii, *Graells.*
nodosa, *Féruss.*

Genus FAUNUS, Montfort.

Shell subulate; spire elongated, many-whorled, whorls smooth, covered with a dark-coloured epidermis; aperture widely emarginate in front; inner lip thickened, with a callus posteriorly; outer lip dilated, the margin sinuated towards the hind part.

Syn. Pirena, *Lam.* Ebena, *Schum.* Pyrena, *Mke.* Melanomona, *Bowd.*

Ex. F. ater, *Linnæus*, pl. 32, fig. 9. Operculum, F. ater, fig. 9, *a*, 9, *b*. Shell, F. ater, fig. 9, *c*.

The species of this genus, which differs from *Melanopsis* in the length of the spire, and in the sinuated, broadly-expanded outer lip, inhabit the beds of tropical rivers and rivulets, where they may be seen crawling on the soft mud at the bottom, feeding, apparently, on the decayed vegetable matter.

Species of Faunus.

ater, *Linn.*
Cecillii, *Phil.*
princeps, *Lea.*

Sub-gen. MELANATRIA, Bowdich.

Whorls subnodose; aperture with the notch at the fore part wide and somewhat obsolete; outer lip slightly sinuated.

fluminea, *Gmel.*

Genus CLIONELLA, Gray.

Shell fusiform, whorls longitudinally ribbed, the last anteriorly contracted; aperture produced in front into a rather wide channel; outer lip with a deep sinus at the hind part.

Syn. ? Melatoma, *Swains.*, not *Anthony.*

Ex. C. buccinoides, *Lamarck*, pl. 32, fig. 10. Operculum, C. buccinoides, fig. 10, *a*, 10, *b*. Shell, C. buccinoides, fig. 10, *c*.

The shells comprised in this genus have very much the aspect of fresh-water *Clavatulæ*; some of the species are said to be inhabitants of the rivers of Africa.

Species of Clionella.

buccinoides, *Lam.*
semicostata, *Kien.*
sigillata, *Reeve.*
stolida, *Hinds.*
striâta, *Kien.*

Fam. LITTORINIDÆ.

Tongue long, armed with seven rows of teeth (3·1·3), the median broad and hooked, the lateral, or uncini, hooked and oblong; the outer lateral teeth conical, curved. Rostrum moderate, entire; eyes sessile on the outer side of the tentacles; no neck-lobes or lateral cirrhi. Mantle with a rudimentary siphonal fold in front; gills two, one very large, occupying nearly the whole surface of the branchial cavity, and formed of flat, free plates. Foot with a linear duplication in front, and a groove along the under surface.

Operculum horny, spiral, of few whorls.

Shell spiral, turbinated or depressed; aperture simple in front, never pearly within.

Genus LITTORINA, Férussac.

Eyes sessile near the outer bases of the tentacles.

Operculum paucispiral.

Shell turbinate, solid, few-whorled, axis imperforate; spire short; aperture subcircular, entire; columellar lip rather flattened; outer lip simple, acute.

Syn. Trochus, *Adans.*, not *Linn.* Turbo, *Swains.*, not *Linn.* Bacalia, *Gray.*

Ex. L. littorea, *Linnæus*, pl. 33, fig. 1. Operculum, L. littorea, fig. 1, *a*, 1, *b*. Shell, L. littorea, fig. 1, *c*.

The animals of this genus are, in a great measure, amphibious, living on the rocks along the shore; many species are nearly always out of the water, but usually place themselves within the wash of the tide. They are very

numerous in species, and are found in all parts of the world; a few kinds are extensively used for food, as the "Periwinkle."

Species of Littorina.

aberrans, *Phil.*
acuminata, *Gould.*
albicans, *Metcalfe.*
albida, *Phil.*
atrata, *C. B. Adams.*
caliginosa, *Gould.*
castanea, *Adams and Reeve.*
cingulata, *Phil.*
columna, *Jonas.*
conica, *Phil.*
debilis, *Phil.*
exarata, *Phil.*
fabalis, *Turt.*
fasciata, *Gray.*
filosa, *Sow.*
flammea, *Phil.*
glabrata, *Phil.*
grandis, *Midd.*
globosa, *Dkr.*
Grœnlandica, *Chem.*
Jamaicensis, *C. B. Adams.*
Kurila, *Midd.*
lævis, *Phil.*
lemniscata, *Phil.*
lepida, *Gould.*
limata, *Lovén.*
limax, *Martyn.*
littorea, *Linn.*
lunata, *Migh.*
Malaccana, *Phil.*
mespilum, *Mühlf.*
modesta, *Phil.*
nigrolineata, *Gray.*
obliquata, *Say.*
obesa, *Sow.*
pallescens, *Phil.*
palliata, *Say.*
patula, *Jeffr.*
plena, *Gould.*
porcata, *Phil.*
rudis, *Donov.*
rugosa, *Mke.*
saxatilis, *Donov.*
Sayii, *Phil.*
scutulata, *Gould.*
Sieboldii, *Phil.*
Sinensis, *Phil.*
Sitchana, *Phil.*
squalida, *Brod. and Sow.*
subtenebrosa, *Midd.*
sulcata, *Lam.*
sulculosa, *Phil.*
tenebrosa, *Mont.*
tenuis, *Phil.*
varia, *Sow.*
ventricosa, *Phil.*

Sub-gen. MELARAPHE, Mühlfeldt (Melaraphis, *Stentz*).

Shell thin, imperforate; spire acuminate, whorls flattened, usually transversely striated, and adorned with coloured markings; aperture effuse anteriorly; columella excavated.

Africana, *Krauss.*
angulifera, *Lam.*
antipodum, *Phil.*
Araucana, *D'Orb.*
aspera, *Phil.*
carinata, *D'Orb.*
carinifera, *Mke.*
cincta, *Quoy and Gaim.*
cingulifera, *Dkr.*
columellaris, *D'Orb.*
conspersa, *Phil.*
decollata, *Krauss.*
Diemenensis, *Quoy and Gaim.*
D'Orbignyana, *Phil.*
fasciata, *Gray.*
flava, *Brod.*
Gundlachi, *Phil.*
guttata, *Phil.*
intermedia, *Phil.*
Kynsnaensis, *Krauss.*
lineata, *D'Orb.*
Mauritiana, *Lam.*
molanostoma, *Gray.*
minima, *Wood.*
nebulosa, *Lam.*
neritoides, *Linn.*
parvula, *Phil.*
Paytensis, *Phil.*
Peruviana, *Lam.*
phasianella, *Phil.*
picta, *Phil.*
pintado, *Wood.*
planaxis, *Nutt.*
pulchella, *Dkr.*
pulchra, *Swains.*
punctata, *Gmel.*
puncticulata, *Phil.*
pusilla, *Phil.*
reticulata, *Anton.*
scabra, *Linn.*
striata, *King.*
Syriaca, *Phil.*
tessellata, *Phil.*
tigrina, *D'Orb.*
undulata, *D'Orb.*
zebra, *Wood.*
zic-zac, *Chem.*

Sub-gen. NERITOIDES, Brown.

Shell turbinate, solid, imperforate; spire very short, apex obtuse; outer lip thickened internally.

arctica, *Möll.*
irrorata, *Say.*
obtusata, *Linn.*

Genus TECTARIUS, Valenciennes.

Operculum subcircular, paucispiral, with a broad, membranous edge.

Shell turbinate, subconical, tuberculate or muricated, axis imperforate; spire acuminated; aperture oval, entire; inner lip with a callosity anteriorly; outer lip thin, striated internally.

Syn. ? Hamus, *Klein.* Tectaria, *Guer.* Pagodus, *Gray.* Pagoda, *Mrs. Gray.* Pagodella, *Swains.*

Ex. T. pagodus, *Linnæus*, pl. 33, fig. 2. Operculum, T. pagodus, fig. 2, *a*, 2, *b*. Shell, T. pagodus, fig. 2, *c*.

The aperture in this genus is ovate, and not pearly within; the axis is imperforate, the whorls are tuberculate or muricated, and the operculum is of few whorls.

Species of Tectarius.

affinis, *D'Orb.*
Antoni, *Phil.*
bicolor, *Lam.*
breviculus, *Phil.*
dilatatus, *D'Orb.*
granosus, *Phil.*
granularis, *Gray.*
leucostictus, *Phil.*
miliaris, *Quoy and Gaim.*
millegrana, *Phil.*
muricatus, *Linn.*
Natalensis, *Krauss.*
nodosus, *Gray.*
nodulosus, *Pfeiff.*
pagodus, *Linn.*
papillosus, *Lam.*
perlatus, *Phil.*
pyramidalis, *Quoy and Gaim.*
rugosus, *Gray.*
subnodosus, *Phil.*
tectum-persicum, *Linn.*
trochiformis, *Dillw.*
trochoides, *Gray.*
tuberculatus, *Gray.*
vilis, *Mke.*

Genus ECHINELLA, Swainson.

Operculum circular, many-whorled.

Shell turbinately conoidal, axis more or less distinctly perforated, whorls muricate or granulated; aperture ovate; inner lip arcuate, edentulous, or with an obscure tooth-like callus at the fore part; outer lip acute.

Syn. Nina, *Gray.*

Ex. E. Cumingii, *Philippi*, pl. 33, fig. 3. Operculum, E. Cumingii, fig. 3, *a*, 3, *b*.

In *E. coronaria* the tooth is inconspicuous, but the axis is perforated, and the operculum is orbicular and many-whorled; the same characters are present in *E. Cumingii*, which constitutes the type of the *Nina* of Gray.

Species of Echinella.

coronaria, *Lam.*
Cumingii, *Phil.*
granulata, *Swains.*

Genus MODULUS, Gray.

Eyes on the middle of the tentacles.

Operculum orbicular, many-whorled.

Shell turbinate, depressed or trochiform, porcellanous, axis perforate; aperture oval; inner lip with a strong, plait-like tooth at the fore part; outer lip acute.

Syn. Monodonta, *Swains.*, not *Lam.*

Ex. M. tectum, *Gmelin*, pl. 33, fig. 4. Operculum, M. tectum, fig. 4, *a*, 4, *b*. Shell, M. lenticularis, *Chemnitz*, fig. 4, *c*.

. The eyes in *Modulus* are situated half way up the tentacles, the aperture of the shell is not pearly within, and the inner lip is furnished with a strong tooth; the operculum, moreover, is nearly circular, and is composed of several whorls.

Species of Modulus.

angulatus, *C. B. Adams.*
candidus, *Petit.*
catenulatus, *Phil.*
cerodes, *A. Adams.*
disculus, *Phil.*
duplicatus, *A. Adams.*
lenticularis, *Chem.*
obliquatus, *A. Adams.*
tectum, *Gmel.*
unidens, *Lister.*

Genus RISELLA, Gray.

Eyes situated on the tentacles.

Operculum ovate, subspiral.

Shell trochiform, with a flat or concave base, axis imperforate, whorls flattened, the last angulated, often acutely keeled; aperture depressed, oblique, rhombic, dark or variegated internally; outer lip acute, simple.

Syn. Bembicium, *Phil.*

Ex. R. lutea, *Quoy and Gaimard*, pl. 33, fig. 5. Operculum, R. melanostoma, *Gmelin*, fig. 5, *a*, 5, *b*. Shell, R. melanostoma, fig. 5, *c*.

This genus is known among the *Littorinidæ* by its imperforate, top-shaped shell; the absence of eye-peduncles and lateral membrane of the foot, and the shell not being pearly within, prevents it from being confounded with the *Trochidæ*.

Species of Risella.

imbricata, *Gray.*
livida, *Phil.*
lutea, *Quoy and Gaim.*
melanostoma, *Gmel.*
nana, *Lam.*
plana, *Quoy and Gaim.*
vittata, *Phil.*

Genus LACUNA, Turton.

Operculigerous lobe winged at the sides and furnished behind with two filaments.

Shell turbinated, solid or thin, subglobose or conical; spire short or somewhat produced; aperture semilunar; columellar lip flattened, with a parallel, umbilical fissure; outer lip acute.

Syn. Temana, *Leach.*

Ex. L. divaricata, *O. Fabricius*, pl. 33, fig. 6. Operculum, L. pallidula, *Da Costa*, fig. 6, *a*, 6, *b*. Shell, L. pallidula, fig. 6, *c*.

The *Lacunæ* feed upon sea-weed, and Lovén observes that when the *fucus* is of a brown colour, the animals become green, but if red, they assume a rosy tint. They principally inhabit the shores of northern countries, and species occur both in England and North America.

Species of Lacuna.

pallidula, *Da Costa.*
puteolus, *Turt.*
rufa, *Da Costa.*

Sub-gen. EPHERIA, Leach.

Shell thin, usually with coloured bands; spire rather elevated; inner lip thin, acute; umbilical fissure linear.

albella, *Lovén.*
canalis, *Mont.*
carinata, *Gould.*
carinifera, *A. Adams.*
divaricata, *O. Fabr.*
fasciata, *Adams.*
fragilis, *Mke.*
frigida, *Lovén.*
glacialis, *Müll.*
quadrifasciata, *Mont.*

Sub-gen. MEDORIA, Leach.

Shell conical, solid; spire elevated; peritreme dilated and reflexed anteriorly; inner lip thick, flattened; umbilical fissure obsolete.

crassior, *Walker.*
labiosa, *Lovén.*
solidula, *Lovén.*

Genus FOSSAR, Adanson.

Tentacles furnished, internally, with a frontal lobe.

Operculum ovate, subspiral.

Shell semiglobose, whorls ribbed or cancellated, axis perforate; aperture semi-rotundate, entire; inner lip straight, edentulate, never callous; outer lip acute, smooth internally.

Syn. Fossarus, *Phil.* Maravignia, *Aradas and Mag.* Naticella, *Munster.* Phasianema, *S. Wood.*

Ex. F. ambiguus, *Linnæus*, pl. 33, fig. 7. Operculum, F. variegatus, *A. Adams*, fig. 7, *a*, 7, *b*. Shell, F. costatus, *Brocchi*, fig. 7, *c*.

The great peculiarity of this genus is the fact of the animal having two frontal lobes between the tentacles.

The recent species are few in number, one is from Senegal, two are from the Mediterranean, and the others are from the Eastern Seas, and South America.

Species of Fossar.

abjectus, *C. B. Adams* (Adeorbis).
ambiguus, *Linn.*
angiostoma, *C. B. Adams.*
bicarinatus, *A. Adams.*
clathratus, *Phil.*
costatus, *Brocc.*
Cumingii, *A. Adams.*
excavatus, *C. B. Adams.*
foveatus, *C. B. Adams.*
megastoma, *C. B. Adams.*
pusillus, *Gould* (Trichotropis).
reticulatus, *A. Adams.*
trochlearis, *A. Adams.*
variegatus, *A. Adams.*

Genus ISAPIS, H. and A. Adams.

Shell umbilicated; spire elevated, whorls rounded, transversely ribbed and cancellated; aperture ovate; columella slightly arcuated, with a strong tooth in the middle; outer lip simple externally, strongly lirate internally, margin dentate.

Ex. I. anomala, *C. B. Adams,* pl. 33, fig. 8.

This genus, of which but a single species is known, is founded upon a curious little shell described by the late Professor Adams as *Narica anomala;* the tooth in the middle of the inner lip is the principal character which distinguishes the genus from *Fossar.*

Genus LITHOGLYPHUS, Müllfeldt.

Tentacles subulate; eyes at their outer bases.

Operculum ovate, few-whorled.

Shell semiglobose, thick, solid; spire short, obtuse,

whorls few, smooth; aperture large, ovate, entire, peristome continuous; inner lip callous; outer lip simple; umbilicus rimate.

Syn. Lithoclyptus, *Christ. and Jans.* Paludestrina, *D'Orb.* Lithoglypter, *Fitz.*

Ex. L. lapidum, *D'Orbigny*, pl. 34, fig. 1. Operculum, L. naticoides, *Férussac*, fig. 1, *a*, 1, *b*. Shell, L. naticoides, fig. 1, *c*.

The typical species of this genus is from the river Danube; a few other species are inhabitants of the fresh waters of South America, and have been described by M. D'Orbigny under the name of *Paludestrina*.

Species of Lithoglyphus.

fuscus, *Ziegl.*
lapidum, *D'Orb.*
naticoides, *Féruss.*
piscium, *D'Orb.*
prasinus, *Koch.*

Fam. PLANAXIDÆ.

Lingual membrane with seven series of teeth (3·1·3), the outer lateral teeth conical, curved. Rostrum elongate; tentacles subulate, with the eyes sessile at their external bases. Mantle with a produced siphon in front; gill in several lines on the inner side of the mantle-cavity. Foot simple, or furnished with tentacular filaments.

Operculum ovate, subspiral.

Shell with the fore part of the aperture emarginate.

Marine.

In general structure, as well as in their habits, the animals of this family most nearly resemble the *Littori-*

nidæ, but the presence of a siphon, and a distinct notch at the fore part of the aperture, prevent their being associated with that group.

Sub-fam. PLANAXINÆ.

Sides of the foot and operculigerous lobe simple. Operculum ovate, subspiral.

Littoral.

Genus PLANAXIS, Lamarck.

Shell solid, ovately conical; spire acuminate; aperture oblong, with a distinct notch in front; columellar lip flattened, smooth, truncate anteriorly, with a wide callosity at the hind part; outer lip thickened, grooved internally.

Ex. P. nigra, *Lesson*, pl. 34, fig. 2. Operculum, P. sulcata, *Born*, fig. 2, *a*, 2, *b*. Shell, P. sulcata, fig. 2, *c*.

The animals of this genus are marine and somewhat amphibious in their habits, crawling on the stones near the margins of pools left by the retiring tide; some of the species affect the vicinity of mangrove swamps, and may be seen adhering to the roots above the surface of the water.

Species of Planaxis.

acuta, *Krauss.*
areolata, *Less.*
atropurpurea, *Recluz.*
brevis, *Quoy.*
buccinea, *A. Adams.*
buccinoides, *Desh.*
cingulata, *A. Adams.*
circinata, *Less.*
labiosa, *A. Adams.*
lineata, *Da Costa.*
lineolata, *Gould.*
nigra, *Lesson.*
nigritella, *Forbes.*
nucleus, *Lam.*

obscura, *A. Adams.*
obsoleta, *Mke.*
pigra, *Forbes.*
planicostata, *Sow.*
semisulcata, *Sow.*
succincta, *A. Adams.*
sulcata, *Born.*
tæniata, *Phil.*
undulata, *Lam.*
zonata, *A. Adams.*

Sub-gen. HINEA, Gray.

Shell smooth, covered with a brownish-yellow epidermis, whorls flattened; outer lip thickened, and grooved internally.

Braziliana, *Lam.*
fulva, *A. Adams.*
lævigata, *Leach.*

Genus QUOYIA, Deshayes.

Shell solid, elongately conical; spire produced, the apex decollated, whorls flat, the last subangulated; aperture small, semicircular, slightly notched in front; columella smooth, rounded, truncate anteriorly, and with a spiral, acute callus towards the hind part; outer lip grooved internally.

Syn. Fissilabra, *Brown.* Leucostoma, *Swains.*

Ex. Q. decollata, *Quoy and Gaimard*, pl. 34, fig. 3. Operculum, Q. decollata, fig. 3, *a*, 3, *b*. Shell, Q. decollata, fig. 3, *c*.

In this genus the anterior notch of the aperture is not so distinct as in *Planaxis*, the columellar lip is not flattened, and is furnished with a spiral, callous keel which winds round the hind part.

Genus HOLCOSTOMA, H. and A. Adams.

Shell ovate, thin; spire short, acuminate, suture channelled; aperture obpyriform, posteriorly canaliculated, anteriorly emarginate; columella arcuate, smooth, with a posterior callosity; outer lip expanded, the margin everted, posteriorly free and ascending on the body-whorl.

Ex. H. piligerum, *Philippi*, pl. 33, fig. 4.

The shell on which we have founded this genus differs from *Quoyia* and *Planaxis* in being thin, and in the aperture being furnished with a posterior canal which extends up the last whorl; it is covered with an epidermis curiously adorned with rows of golden bristles.

Sub-fam. LITIOPINÆ.

Sides of the foot and operculigerous lobe furnished with tentacular filaments. Operculum horny, of many whorls.

Pelagian.

Genus LITIOPA, Rang.

Shell thin, horny, semipellucid, conoidal; spire acute, whorls rounded, the last large; aperture oval, emarginate anteriorly; outer lip thin, simple, acute.

Syn. Bombyxinus, *Bélanger*, *Lesson*.

Ex. L. melanostoma, *Eydoux and Souleyet*, pl. 34, fig. 5. Shell, L. bombyx, *Rang*. fig. 5, *a*.

The singular little oceanic Mollusks which constitute this genus have the power of spinning glutinous threads

by which they, occasionally, suspend themselves from the stems of floating gulf-weed, among which they take up their abode; if the thread by any chance becomes divided, the animal emits a bubble enveloped in a glutinous secretion, which rises to the surface, drawing out threads as it ascends, and finally becomes attached to the weeds above.

Species of Litiopa.

bombyx, *Rang.*
decussata, *Gould.*
effusa, *C. B. Adams.*
melanostoma, *Eyd. and Soul.*
obesa, *C. B. Adams.*
striata, *Pfeiff.*

Fam. RISSOELLIDÆ.

Lingual membrane with five series of teeth (2·1·2), central teeth broad, crenulated; lateral, two on each side, the inner broad and crenulated, the outer small and hooked. Rostrum divided into two tentacular lobes in front; eyes sessile on the bases of the tentacles, or on the head, far behind them. Mantle simple in front.

Operculum annular, regular, with an internal process.

Shell elevately spiral; aperture simple, or slightly emarginate in front.

The lingual armature of this family shows an affinity to the *Littorinidæ*, and the bilobate mouth and absence of retractile proboscis indicate them to be vegetable feeders.

Genus RISSOELLA, Gray.

Eyes on the head, far behind the tentacles; tentacles simple; lobes of rostrum elongate.

Operculum half-ovate, annular, nucleus near the inner straight edge, with a central internal process.

Shell thin, spiral, conical or subglobose, transparent; aperture ovate, rounded and simple in front, peristome thin, entire.

Syn. Jeffreysia, *Alder.*

Ex. R. diaphana, *Alder*, pl. 34, fig. 6. Operculum, R. diaphana, fig. 6, *a*, 6, *b*, 6, *c*. Shell, R. glabra, fig. 6, *d*.

These curious little animals are found adhering to floating sea-weeds, in pools between tide-marks; their eyes are situated so far behind on the head, that the transparency of the shell seems to be essential to the vision of the animal.

Species of Rissoella.

conica, *C. B. Adams.*
diaphana, *Alder.*
glabra, *Alder.*
globularis, *Jeffr.*
opalina, *Jeffr.*

Genus HYALA, H. and A. Adams.

Tentacles with fine setæ at the summit; eyes sessile on the centre of their bases.

Operculum thin, horny, simple, subspiral.

Shell thin, hyaline, spiral, subconical; aperture ovate, emarginate anteriorly; outer lip thin, simple, straight.

Ex. H. vitrea, *Montagu*, pl. 34, fig. 7. Shell, H. vitrea, fig. 7, *a*.

The foot is simple behind, and there is no filament on the margin of the operculigerous lobe. Were it not for the persistent rostrum, the position of the eyes and general

character of the shell would indicate *Pyramidellidæ* to be the best position for this genus.

Fam. RISSOIDÆ.

Lingual membrane with the inner lateral teeth very broad, the apices incurved, lobed; outer laterals dissimilar, all with denticulated apices. Rostrum more or less adnate, below, to the fore part of the foot; tentacles setaceous, with the eyes on bulgings at their outer bases; neck-lobes none. Foot angulated in front, acuminate behind; operculigerous lobe with developed lateral expansions, and usually furnished with a caudal, tentacular filament.

Operculum horny, subspiral.

Shell generally white, spiral, more or less turreted; aperture usually simple in front.

Genus RISSOINA, D'Orbigny.

Operculum semilunar, subspiral; muscular impression longitudinal, with an elongated process before it.

Shell turreted, ribbed or cancellated, many-whorled; spire acuminate; aperture ovate, effuse anteriorly, slightly channelled in front; outer lip anteriorly dilated, thickened internally.

Ex. R. Cumingii, *Reeve*, pl. 35, fig. 1. Operculum, R. cælata, *A. Adams*, fig. 1, *a*, 1, *b*.

The species of this genus are very numerous, and are usually regarded as *Rissoæ;* the mouth of the shell being somewhat canaliculated, and the peculiar operculum,

which is furnished, as in *Nerita* and *Rissoella*, with an internal appendage, serve, however, to distinguish them.

Species of Rissoina.

bellula, *A. Adams.*
Bruguiéri, *Payr.*
Bryerii, *Mont.*
cælata, *A. Adams.*
cancellata, *Phil.*
cerithina, *Phil.*
Chesnelii, *Mich.*
clandestina, *C. B. Adams.*
clathrata, *A. Adams.*
costata, *A. Adams.*
Cumingii, *Reeve.*
decussata, *Dugè.*
deformis, *Sow.*
delicata, *Phil.*
D'Orbignyi, *A. Adams.*
dubiosa, *C. B. Adams.*
excavata, *Phil.*
fasciata, *A. Adams.*
firmata, *C. B. Adams.*
fortis, *C. B. Adams.*
grandis, *Phil.*
Inca, *D'Orb.*
insculpta, *Recluz.*
insignis, *Adams and Reeve.*
micans, *A. Adams.*
minutissima, *Mich.*
monilis, *A. Adams.*
nitida, *A. Adams.*
nivea, *A. Adams.*
nodicincta, *A. Adams.*
notabilis, *C. B. Adams.*
Philippiana, *Pfeiff.*
plicata, *A. Adams.*
pulchra, *C. B. Adams.*
pusilla, *Brocc.*
pyramidalis, *A. Adams.*
scalarella, *C. B. Adams.*
scalariana, *A. Adams.*
scalariformis, *C. B. Adams.*
scalarioides, *C. B. Adams.*
semistriata, *Phil.*
spirata, *Sow.*
striata, *Quoy and Gaim.*
striolata, *A. Adams.*
subangulata, *C. B. Adams.*
tridentata, *Mich.*

Sub-gen. ZEBINA, H. and A. Adams.

Shell white, solid, opaque, polished, smooth or partially striated; outer lip thickened, often with one or more tubercles internally at the fore part.

albida, *C. B. Adams.*
concinna, *A. Adams.*

coronata, *Recluz.*
curta, *Sow.*
decussata, *Sow.*
eulimoides, *A. Adams.*
lævissima, *C. B. Adams.*
princeps, *C. B. Adams.*
semiglabrata, *A. Adams.*

Genus RISSOA, Fréminville.

Opercular lobe with a single, distinct cirrhus at the hind part.

Operculum ovate, subspiral, simple.

Shell usually white, solid, conical; spire pointed, many-whorled, whorls convex, smooth or longitudinally ribbed; aperture ovate; outer lip more or less dilated and thickened externally.

Syn. Loxostoma, *Bivon.* Lamarckia, *Leach.* Rissoaria, *Agass.* Gonostoma, *Mühlf.*, not *Held.* Anatasia, *Gist.*

Ex. R. monodonta, *Philippi*, pl. 35, fig. 2. Operculum, R. labiosa, *Montagu*, fig. 2, *a*, 2, *b*. Shell, R. labiosa, fig. 2, *c*.

In this genus the operculigerous lobe is furnished posteriorly with a single cirrhus or tapering filament; the species are very numerous, and are usually of a white colour; they are found in all parts of the world, living among sea-weed in shallow water.

Species of Rissoa.

aberrans, *C. B. Adams.*
albella, *Lovén.*
arata, *Phil.*
bulimoides, *C. B. Adams.*
Caspica, *Eichw.*
castanea, *Recluz.*
cornea, *Lovén.*
costata, *Adams.*
crassicostata, *C. B. Adams.*
elegans, *A. Adams.*
elongata, *Phil.*
exarata, *Stimp.*
excavata, *Phil.*
exigua, *Mich.*

fragilis, *Mich.*
granosa, *Mich.*
hyalina, *Dësm.*
inconspicua, *Alder.*
infrequens, *C. B. Adams.*
Janus, *C. B. Adams.*.
labiosa, *Mont.*
lævigata, *C. B. Adams.*
lilacina, *Recluz.*
lineolata, *Mich.*
monodonta, *Phil.*
multicostata, *C. B. Adams.*
oblonga, *Desm.*
parva, *Da Costa.*
pigmæa, *Mich.*
pinnæ, *Krauss.*
pulchella, *Phil.*
punctulum, *Phil.*
radiata, *Phil.*
rufa, *Phil.*
rufilabris, *Leach.*
scalaris, *Mich.*
solidula, *Phil.*
striosa, *C. B. Adams.*
stricta, *Mke.*
variabilis, *Mühlf.*
ventricosa, *Desm.*
venusta, *Phil.*
violacea, *Desm.*
vitrea, *Phil.*

Sub-gen. ACME, Hartman (Zippora, *Leach*).

Shell aciculate, smooth or longitudinally ribbed, whorls very numerous; aperture oval, entire; peritreme widely reflexed.

acicula, *Sow.*
auriscalpium, *Linn.*
Drummondii, *Leach.*

Genus ALVANIA, Risso.

Operculigerous lobe winged on each side, usually with three caudal cirrhi.

Operculum simple, subspiral.

Shell ovate-acute, somewhat turbiniform; spire short, whorls rounded, usually cancellated; aperture subcircular, often crenate internally; outer lip with a marginal varix.

Syn. Persephona, *Leach.* Cyclostrema, *Flem.*, not *Marryatt.* Turbona, *Leach.*

Ex. A. abyssicola, *Forbes*, pl. 35, fig. 3. Shell, A. calathiscus, *Montagu*, fig. 3, *a*.

In this genus the shells are turbinate, with rounded apertures and cancellated whorls, and there is a conspicuous varix on the outer lip; the species appear chiefly to abound along the shores of temperate countries.

Species of Alvania.

abyssicola, *Forbes*.
Beanii, *Hanley*.
calathiscus, *Mont*.
cancellata, *Lam*.
cimex, *Linn*.
costulata, *Risso*.
crenulata, *Mich*.
Europæa, *Risso*.
fenestrata, *Krauss*.
fulva, *Mich*.
Gougeti, *Mich*.
grossa, *Mich*.
marginata, *Mich*.
Montagui, *Payr*.
sculpta, *Phil*.
striatula, *Linn*.
trochlea, *Mich*.
Zetlandica, *Mont*.

Genus ONOBA, H. and A. Adams.

Operculum ovate, simple, subspiral.

Shell elongated, whorls numerous, rounded, spirally striated; aperture oval, entire in front, peritreme continuous, thickened, straight or slightly everted.

Syn. Turbonilla, *Leach*, not *Risso*.

Ex. O. striata, *Montagu*, pl. 35, fig. 4.

This genus includes a small group of elegantly-formed shells, more or less partaking of the characters of *Rissoa*, but their whorls are not longitudinally ribbed, and the peritreme is not dilated.

Species of Onoba.

arctica, *Lovén.*
bella, *A. Adams.*
multilineata, *Stimp.*
robusta, *Migh.*
striata, *Mont.*
tenella, *A. Adams.*
turriculus, *Migh.*

Genus BARLEEIA, Clark.

Operculigerous lobe simple; foot slightly emarginate posteriorly.

Operculum testaceous, subannular, under surface with a raised rib, and a long, pointed, testaceous apophysis proceeding from the nucleus.

Shell turbinately conical, whorls tumid, smooth or transversely striated; aperture oval, entire, contracted behind, rounded in front; outer lip acute, simple.

Ex. B. rubra, *Adams*, pl. 35, fig. 5.

The tentacles in this genus are short, broad, rounded at the tips, and not setaceous; the eyes are large, on inflations at the outer bases of the tentacles; the rostrum is simple and not cloven; the foot is emarginate behind, and the opercular lobe is simple. The operculum is subannular, as in *Rissoella*, and is furnished with a similar appendage proceeding from the nucleus, which latter is nearer the base than the centre. The position of the eyes is similar to that of the other genera of *Rissoidæ*, and the genus seems to differ from *Cingula* in the circumstance of the annular operculum, with its long, pointed apophysis; *Rissoina* has a similar appendage, but the operculum in that genus is subspiral.

Genus CERATIA, H. and A. Adams.

Tentacles flat, rather short, claviform at the tip, clothed with aciculate setæ; foot divided behind into two long, distinct tails; operculigerous lobe without a caudal cirrhus.

Shell sub-cylindrical, spirally striated, white, semipellucid, thin, whorls rounded, the last nearly as long as the spire, suture deep, apex of spire obtuse; aperture subovate, peristome continuous, outer lip thin, acute, simple.

Ex. C. proxima, *Alder*, pl. 35, fig. 6.

This genus, founded on the *Rissoa proxima* of Alder, is remarkable for the bifid nature of the hind part of the foot, resembling, in this respect, the tail of *Nassa*.

Genus SETIA, H. and A. Adams.

Tentacles pilose; foot simple behind; operculigerous lobe small, without a caudal cirrhus.

Shell thin, obovate, oblong, or subconic, sub-umbilicated, whorls few, ventricose, spotted; spire short, apex obtuse; aperture suborbicular, narrowed behind; inner lip somewhat straight; outer lip thin, simple, acute.

Ex. S. pulcherrima, *Jeffreys*, pl. 35, fig. 7.

In this small group, founded on the *Rissoa pulcherrima* of Jeffreys, the opercular lobe is simple, the tentacles are pilose, and the shells are umbilicated, with spot-like markings on the whorls.

Species of Setia.

fulgida, *Adams.*
pulcherrima, *Jeffr.*
soluta, *Phil.*

Genus CINGULA, Fleming.

Opercular lobe and caudal cirrhus indistinct or rudimentary.

Operculum ovate, simple, subspiral.

Shell thin, elevately conical, smooth or transversely striated, variegated or banded, whorls flat; aperture pyriform or oval; outer lip straight, thin, acute, not reflexed, or furnished with a marginal varix.

Syn. Sabinæa, *Leach.*

Ex. C. cingillus, *Montagu*, pl. 35, fig. 8. Operculum, C. cingillus, fig. 8, *a*, 8, *b*. Shell, C. cingillus, fig. 8, *c*.

Species of Cingula.

arenaria, *Migh. and Adams.*
cingillus, *Mont.*
concinna, *C. B. Adams.*
conica, *C. B. Adams.*
eburnea, *Stimp.*
inconspicua, *C. B. Adams.*
interrupta, *Adams.*
lævis, *Dekay.*
latior, *Migh. and Adams.*
minuta, *Gould.*
modesta, *H. C. Lea.*
nigra, *Krauss.*
paupercula, *C. B. Adams.*
porifera, *Lovén.*
punctura, *Mont.*
Sarsii, *Lovén.*
saxicola, *C. B. Adams.*
semicostata, *Migh. and Adams.*
semistriata, *Mont.*
solida, *C. B. Adams.*
terebellum, *C. B. Adams.*
turrita, *C. B. Adams.*
unifasciata, *Mont.*

Genus SKENEA, Fleming.

Operculigerous lobe with small lateral wings and a rudimentary posterior cirrhus.

Operculum of few whorls, nucleus central.

Shell orbicular, spiral, depressed and discoidal, deeply umbilicated, few-whorled; peritreme circular, continuous, entire.

Ex. S. planorbis, *O. Fabricius*, pl. 35, fig. 9. Operculum, S. planorbis, fig. 9, *a*, 9, *b*. Shell, S. planorbis, fig. 9, *c*, 9, *d*.

This small genus, known by its planorbular, depressed shell, has the eyes on bulgings at the outer bases of the tentacles, and the opercular lobe as in *Rissoa;* the other small, depressed British shells, usually associated with it, appear to belong to the genus *Cyclostrema* of Marryatt, not of Fleming, and constitute the *Delphinoidea* of Brown.

Genus HYDROBIA, Hartman.

Operculigerous lobe simple.

Operculum subspiral.

Shell elongately conical, thin, smooth, covered with an olivaceous epidermis, axis imperforate; aperture oval, peritreme continuous, outer lip acute, simple.

Syn. Leachia, *Risso*, not *Lesueur* or *Johnst.* Littorinella, *Braun.*

Ex. H. ulvæ, *Pennant*, pl. 35, fig. 10. Operculum, H. ulvæ, fig. 10, *a*, 10, *b*. Shell, H. ulvæ, fig. 10, *c*.

The species of this genus inhabit fresh or brackish water and muddy estuaries; the tentacles are subulate,

with the eyes at their outer bases; the operculigerous lobe is simple, and the shells are thin and covered with an epidermis.

Species of Hydrobia.

aculeus, *Gould.*
acuta, *Drap.*
anatina, *Jeffr.*
anthracina, *Migh.*
antipodarum, *Gray.*
badia, *Gould.*
castanea, *Möll.*
ciliata, *Gould.*
cincta, *Gould.*
cingulata, *Midd.*
corolla, *Gould.*
coronata, *Pfeiff.*
crystallina, *Pfeiff.*
Egena, *Gould.*
Ferussina, *Desm.*
gracilis, *Gould.*
Jamaicensis, *C. B. Adams.*
nigra, *Quoy and Gaim.*
parvula, *Gould.*
pornicta, *Migh.*
Preissii, *Phil.*
saxatilis, *Möll.*
scrobiculata, *Möll.*
spinifera, *C. B. Adams.*
spinulosa, *Gould.*
subumbilicata, *Mont.*
ulvæ, *Penn.*
unicolor, *Oliv.*
ventricosa, *Mont.*
Zealandiæ, *Gray.*

Genus AMNICOLA, Gould and Haldeman.

Shell thin, turbinate, covered with an epidermis, axis perforated, whorls rounded; aperture circular, peritreme continuous; outer lip simple, acute.

Ex. A. porata, *Say*, pl. 35, fig. 11. Operculum, A. porata, fig. 11, *d*.

This genus comprises a suite of small fresh-water Mollusks with thin, umbilicated shells having rounded whorls; the species appear to be most numerous in North America; the position of the eyes, which are stated to be sessile at the outer bases of the tentacles, will distinguish them from *Paludinella*, which they very much resemble as regards the shell.

Species of Amnicola.

Cincinnatensis, *Anthony.*
grana, *Say.*
isogona, *Anton.*
limosa, *Say.*
lustrica, *Say.*
marginata, *Mich.*
Nichliniana, *Lea*
obtusa, *Whit.*
orbiculata, *Lea.*
porata, *Say.*

Fam. VIVIPARIDÆ.

Tongue very short, armed with seven series of teeth (3·1·3); teeth laminar, longitudinal, ovate, apex recurved, dentate on each side of the tips; inner lateral tooth broad. Rostrum moderate, entire; tentacles tapering, with the eyes on tubercles at their outer bases. Mantle simple in front; gill comb-like, single.

Operculum annular, regular.

Shell spiral, turbinate, covered with an epidermis; aperture simple in front.

The members of this family are fluviatile, inhabiting lakes and streams; the shells of most of them are dingy brown, or covered with a green, horny epidermis; they are distributed nearly all over the world.

Genus VIVIPARA, Lamarck.

Animal with a small lobe on each side of the neck.

Operculum horny, annular, composed of concentric elements around a central nucleus.

Shell thin, turbinated, umbilicated; spire produced, whorls round, smooth or carinated, covered with an oli-

vaceous epidermis; peristome thin, continuous, simple anteriorly. ...

Syn. Viviparus, *Montf.* Paludina, *Lam.* Cyclostoma, *Oken*, not *Lam.* Pleurocera, *Blainv.* Viviparella, Omphemis, Oxytrema, *Rafin.* Henterum, *Hubn.*

Ex. V. fasciata, *Müller*, pl. 36, fig. 1. Operculum, V. fasciata, fig. 1, *a*, 1, *b*. Shell, V. fasciata, fig. 1, *c*.

The *Vivipareæ* inhabit the rivers and lakes throughout the northern Hemisphere. The females are ovo-viviparous, and the young fry are not forsaken by their parent until the end of the second month of their existence, by which time the bands of cilia, which ornament their shells, have disappeared.

Species of Vivipara.

angularis, *Müll.*
angulata, *Lea.*
atra, *Villa.*
Bengalensis, *Lam.*
bicarinata, *Desm.*
Boissieri, *Charp.*
Coosaensis, *Lea.*
costata, *Quoy.*
crassa, *Nutt.*
cyclostomatiformis, *Lea.*
dissimilis, *Müll.*
doliaris, *Gould.*
elongata, *Swains.*
fasciata, *Müll.*
gigantea, *V. d. Busch.*
Haleiana, *Lea.*
Hamiltoni, *Metcalfe.*
inflata, *Bens.*
intertexta, *Say.*
Javanica, *V. d. Busch.*
lacustris, *Beck.*
lecythoides, *Bens.*
melanostoma, *Bens.*
nucleus, *Thomp.*
pyramidata, *V. d. Busch.*
quadrata, *Bens.*
Remossii, *Bens.*
subpurpurea, *Say.*
Swainsonii, *Mörch.*
tricarinata, *Anton.*
Troostiana, *Lea.*
unicolor, *Oliv.*
Warrenii, *Shuttl.*

Sub-gen. MELANTHO, Bowdich.

Shell ovate, solid, axis imperforate, whorls simple; aperture oval; inner lip thickened.

contorta, *Shuttl.*
decisa, *Say.*
decollata, *Sewasch.*
fontinalis, *Phil.*
genicula, *Conr.*
Georgiana, *Lea.*
imperialis, *Lea.*
incrassata, *Lea.*
integra, *Say.*
obesa, *Phil.*
obtusa, *Trosh.*
patula, *Brumati.*
ponderosa, *Say.*
subcarinata, *Say.*

Sub-gen. LAGUNCULA, Benson (Bensonia, *Cantr.*).

Shell turbinated, subglobose; aperture large, oblong, entire, peristome interrupted; outer lip somewhat reflected; umbilicus deep and tortuous.

pulchella, *Bens.*

Genus PALUDOMUS, Swainson.

Animal with the mantle-margin fringed.

Operculum annular, nucleus subcentral.

Shell thick, subglobose or conical, solid, imperforate, smooth or tubercular, covered with an olivaceous epidermis; spire small, shorter than the aperture, apex often eroded; aperture ovate; inner lip convex; thickened; outer lip acute, the margin slightly reflexed.

Syn. Hemimitra, *Swains.*

Ex. P. spurcus, *Eydoux and Souleyet*, pl. 36, fig. 2. Operculum, P. conicus, *Gray*, fig. 2, *a*. Shell, P. globulosus, *Gray*, fig. 2, *b*.

The mantle-margin in this genus appears to be fringed

or festooned, as in *Melania*, and the operculum is composed of concentric elements arranged around a subcentral nucleus. The species, for the most part, come from India and Ceylon.

Species of Paludomus.

abbreviatus, *Reeve.*
acutus, *Reeve.*
bacula, *Reeve.*
bicinctus, *Reeve.*
bifasciatus, *Reeve.*
chilinoides, *Reeve.*
clavatus, *Reeve.*
conicus, *Gray.*
constrictus, *Reeve.*
decussatus, *Reeve.*
globulosus, *Gray.*
Gruneri, *Jonas.*
maurus, *Reeve.*
modicella, *Lea.*
nigricans, *Reeve.*
olivaceus, *Reeve.*
ovatus, *Gray.*
paludinoides, *Reeve.*
phasianinus, *Reeve.*
punctatus, *Reeve.*
sanschauricus, *Gmel.*
spiralis, *Reeve.*
spurcus, *Eyd. and Soul.*
Stephanus, *Reeve.*
Zeylanicus, *Reeve.*

Genus TANALIA, Gray.

Operculum lamellar, with the nucleus near the front of the outer edge.

Shell turbinate, solid, imperforate, whorls transversely striated, muricated, or grooved, covered with a black, horny epidermis; spire short, obtuse; aperture semiovate; inner lip usually flattened; outer lip with the margin crenulated.

Ex. T. aculeata, *Chemnitz*, pl. 36, fig. 3. Operculum, T. Gardneri, *Reeve*, fig. 3, *a*, 3, *b*.

The operculum in this genus is remarkable for the lateral arrangement of the elements, and the marginal

position of the nucleus. The species are from Ceylon, where they inhabit ponds, mountain-streams, and water-courses.

Species of Tanalia.

aculeata, *Chem.*
ærens, *Reeve.*
crinacea, *Reeve.*
dilatata, *Reeve.*
funiculata, *Reeve.*
Gardneri, *Reeve.*
Layardi, *Reeve.*
neritoides, *Reeve.*
picta, *Reeve.*
rudis, *Reeve.*
sulcata, *Reeve.*
Tennantii, *Reeve.*
undata, *Reeve.*

Genus BITHYNIA, Leach.

Animal with a small lobe on one side of the neck.

Operculum shelly on the inner surface, nucleus subcentral.

Shell turbinate, covered with a horny epidermis; spire produced, whorls rounded; peristome continuous, thickened internally.

Syn. Desmarestia, *Hartm.* ? Subulina, *Schmidt*, not *Schum.*

Ex. B. tentaculata, *Linnæus*, pl. 36, fig. 4. Operculum, B. tentaculata, fig. 4, *a*, 4, *b*. Shell, B. tentaculata, fig. 4, *c*.

The female is oviparous and deposits her eggs in a band, attached to stones or the stems of aquatic plants; when she desires to deposit the ova, she seeks some smooth place, and clears the surface with her mouth before commencing; the young are hatched in three or four weeks, and attain their full growth in the second year.

Species of Bithynia.

balthica, *Schmidt.*
bulimoides, *Oliv.*
carinigera, *Beck.*
goniostoma, *Nutt.*
Michaudi, *Duval.*
Orcula, *Bens.*
Preissii, *Phil.*
pulchella, *Hutton.*
rubens, *Mke.*
tentaculata, *Linn.*
thermalis, *Linn.*
ventricosa, *Gray.*
viridis, *Poiret.*

Genus NEMATURA, Benson.

Operculum annular, ovate, thick, shelly, nucleus subcentral, margin grooved.

Shell oval, compressed; apex of spire rather acuminate, whorls few, the last large and ventricose; aperture nearly orbicular, small, oblique, contracted, peritreme continuous, entire.

Ex. N. Deltæ, *Benson*, pl. 36, fig. 5. Operculum, N. polita, *Cantor*, fig. 5, *a*, 5, *b*.

The species of *Nematura* are inhabitants of India and the Islands of the Eastern Archipelago, and are found either attached to the under surface of floating leaves, or crawling out of the water on the muddy margins of ponds, leaving, as they progress, slender tracks behind them.

Species of Nematura.

coarctata, *Lea.*
Deltæ, *Bens.*
glabrata, *A. Adams.*
minima, *Bens.*
olivacea, *A. Adams.*
polita, *Cantor.*
puncticulata, *A. Adams.*
ventricosa, *Quoy and Gaim.*

Fam. VALVATIDÆ.

Lingual membrane with the teeth in seven series (3·1·3), the central teeth broad, with a hooked and denticulated apex, the lateral lanceolate, hooked, and denticulated. Rostrum produced; tentacles cylindrical; the eyes sessile at their external bases. Mantle simple in front; gill plumose, exposed, the lamina pinnate, spirally twisted, protected by a long, slender, respiratory lobe. Foot bilobed in front.

Operculum horny, orbicular, spiral, many-whorled, whorls with a thin, elevated edge.

Shell spiral, turbinate or discoidal, covered with an epidermis; aperture with the peritreme entire.

The species of this family are distributed throughout the temperate regions of the globe, living in slow-running rivers, ditches, and lakes.

Genus VALVATA, O. F. Müller.

Shell turbinate or discoidal, umbilicated, thin, whorls round, simple or keeled, covered with a horny epidermis; aperture circular, peristome continuous.

Syn. Valvearius, *Dum.* Concinna, *Hubn.*

Ex. V. cristata, *Müller*, pl. 36, fig. 6. Operculum, V. piscinalis, *Müller*, fig. 6, *a*, 6, *b*. Shell, V. piscinalis, fig. 6, *c*. V. (Tropidina) tricarinata, *Lesueur*, fig. 6, *d*.

The species of this small genus inhabit the ponds and ditches of Europe and North America. When the animal progresses, the delicate, retractile branchial plume is projected over the neck. The female deposits her eggs

in a single, coriaceous, spherical capsule, which is affixed to stones or the stems of aquatic plants.

Species of Valvata.

contorta, *Müll.*
Guatamalensis, *Morel.*
humerosa, *Say.*
inconspicua, *Gould.*
mucronata, *Mke.*
naticina, *Mke.*
piscinalis, *Müll.*
pupoidea, *Gould.*
Schmidtii, *C. B. Adams.*

Sub-gen. GYRORBIS, Fitzinger (Planella, *Schlüt*).

Shell discoidal; spire depressed, whorls rounded; umbilicus very wide and deep.

annellata, *Mke.*
cristata, *Müll.*
depressa, *Pfeiff.*
gemma, *Ziegl.*
minuta, *Drap.*
pygmæa, *C. B. Adams.*
spirorbis, *Drap.*

Sub-gen. TROPIDINA, H. and A. Adams.

Shell turbinate; spire elevated, whorls rounded, carinated; aperture circular.

bicarinata, *Lea.*
tricarinata, *Lesueur.*

Fam. AMPULLARIIDÆ.

Lingual membrane with seven series of teeth (3·1·3), central teeth acute, lateral, subulate. Rostrum divided into two long tentacular lobes in front; tentacles long and filiform; eyes on peduncles at the outer bases of the tentacles. Mantle with a more or less elongate siphon on

the left side in front; left gill rudimentary; mantle-cavity with a large pulmonary sac on each side. Rectum not traversing the heart. Foot simple.

Operculum annular, regular.

Shell spiral, turbinate, covered with an olivaceous epidermis; aperture simple in front.

The *Ampullariidæ* are fluviatile, and represent, in the ponds and rivers of the tropics, the *Viviparidæ* of more temperate climates. Although distinct gills exist, the respiratory cavity is very large and partly closed, so as to enable these animals to live a long time out of water; in fact, they appear to be truly amphibious, and to be enabled to survive a long drought, and have been known to revive after having been kept several years out of water. The long siphonal tube appears to be formed by the left neck-lappet, which is seen in the *Viviparidæ* in a rudimentary state.

Genus AMPULLARIA, Lamarck.

Respiratory siphon elongate.

Operculum horny, with an external shelly coat.

Shell globose, umbilicated; spire small, last whorl ventricose; aperture oblong, entire, peristome continuous, slightly reflexed, with an internal thickened rim or ledge.

Syn. ? Pila, *Bolt.*, not *Klein*. Ampullarius, *Montf.* Pomacea, *Perry*. Pachystoma, *Guild.*, not *Blum*. Pachylabra, *Swains.*

Ex. A. fasciata, *Gray*, pl. 37, fig. 1. Operculum, A. ampullacea, *Linnæus*, fig. 1, *a*, 1, *b*. Shell, A. ampullacea, fig. 1, *c*.

In this genus the aperture of the shell has a thickened callous ledge just within the peritreme to serve as a

support to the thick, shelly operculum. The species appear to be most numerous in the rivers of Africa and India. Their eggs are large, and are contained in capsules, usually of a greenish colour, disposed in masses, and attached to plants under the water.

Species of Ampullaria.

ampullacea, *Linn.*
aperta, *Phil.*
Aulameri, *Dev. and Hupp.*
carinata, *Swains.*
crassa, *Swains.*
corrugata, *Swains.*
dubia, *Guild.*
eximia, *Dkr.*
fasciata, *Gray.*
Gevesensis, *Desh.*
lineata, *Wagn.*
oblonga, *Swains.*
orbata, *Perry.*
orientalis, *Phil.*
Orocconensis, *Ziegl.*
ovata, *Oliv.*
oviformis, *Desh.*
pallens, *Phil.*
polita, *Desh.*
puncticulata, *Swains.*
pygmæa, *Recluz.*
Sinamarina, *Brug.*
speciosa, *Phil.*
sulcata, *Mouss.*

Genus POMUS, Humphrey.

Siphon elongate.

Operculum horny, dextral.

Shell dextral, globose, widely umbilicated, last whorl very large, ventricose; spire short; aperture entire, oblong, large, expanded, peritreme simple, always thin, sometimes subreflexed.

Syn. Ampullaria, *Guild.*, not *Lam.*

Ex. P. scalaris, *D'Orbigny*, pl. 37, fig. 2. Operculum, P. urceus, *Müller*, fig. 2, *a*, 2, *b*. Shell, P. urceus, fig. 2, *c*.

The genus *Pomus* differs from *Ampullaria* in the absence of the thickened ledge within the peritreme for the

operculum, which latter, moreover, is entirely horny. The species inhabit the lakes and rivers of warm countries, more especially those of South America and the West Indies. In the dry season, they bury themselves deeply in the mud, where they remain in a state of torpidity, and on account of their possessing a pulmonary cavity in addition to the gills, they are enabled sometimes to survive a considerable period after having been removed from the water. The South American Indians term them "Idol shells," and are said to hold them in great veneration.

Species of Pomus.

angulata, *Jonas.*
balanoidea, *Gould.*
canaliculata, *Lam.*
Cecillii, *Phil.*
conica, *Wood.*
cyclostoma, *Spix.*
decussata, *Moric.*
insularum, *D'Orb.*
intermedia, *Féruss.*
Largillierti, *Phil.*
malleata, *Jonas.*
marginata, *Jonas.*
papyracea, *Spix.*
Rossii, *D'Orb.*
scalaris, *D'Orb.*
teres, *Phil.*
urceus, *Müll.*
zonata, *Wagn.*

Genus MARISA, Gray.

Siphon elongate.

Operculum horny, dextral.

Shell dextral, depressed, discoidal, deeply and widely umbilicated; spire very short, whorls rounded; aperture suborbicular, entire, peristome thin, simple.

Syn. Ceratodes, *Guild.* Marissa, *Menke.*

Ex. M. cornu-arietis, *Linnæus*, pl. 37, fig. 3. Oper-

culum, M. cornu-arietis, fig. 3, *a*. 3, *b*. Shell, M. cornu-arietis, fig. 3, *c*.

The shells of this genus are more or less discoidal, and, until the animal was made known by Guilding, were often regarded as species of *Planorbis*.

Species of Marisa.

castanea, *Desh.*
cornu-arietis, *Linn.*
effusa, *Müll.*
fasciata, *Guild.*
luteostoma, *Swains.*
pachystoma, *Phil.*

Genus POMELLA, Gray.

Operculum horny, dextral.

Shell solid; spire short, whorls transversely striated, the last very large; aperture semi-ovate; inner lip concave, broad, flattened, peritreme simple, acute.

Ex. P. megastoma, *Sowerby*, pl. 37, fig. 4. Operculum, P. megastoma, fig. 4, *a*, 4, *b*.

The animal of this genus, of which but a single species is known, has not hitherto been observed. The shell is transversely grooved, of dense structure, and the columellar lip is peculiarly flattened. It is an inhabitant of the rivers of South America.

Genus LANISTES, Montfort.

Operculum horny, sinistral, or with the nucleus on the left margin.

Shell depressed, thin, sinistral, deeply and widely umbilicated; spire short; aperture oblong, entire; inner lip expanded over the last whorl, peristome simple, acute.

Syn. Lanites, *Swains.*

Ex. L. Bolteniana, *Chemnitz*, pl. 37, fig. 5. Operculum, L. Bolteniana, fig. 5, *a*, 5, *b*.

The species of this genus are from the river Nile, Zanzibar, and West Africa. The shell and operculum only are known; the latter is horny and nearly transparent.

Species of Lanistes.

Bolteniana, *Chem.*
Guineensis, *Chem.*
intorta, *Lam.*
Lybica, *Morel.*

Genus MELADOMUS, Swainson.

Operculum horny, sinistral.

Shell sinistral, thin, imperforate, covered with a dark olivaceous epidermis; spire produced, acuminated; aperture oval, reversed, contracted and acute posteriorly, entire in front, peristome thin, simple.

Ex. M. olivaceus, *Sowerby*, pl. 37, fig. 6. Operculum, M. olivaceus, fig. 6, *a*, 6, *b*.

This genus, the animal of which is at present unknown, differs from *Pomus* and *Ampullaria* in being sinistral and turreted. It is an inhabitant of the rivers of Africa.

Genus ASOLENE, D'Orbigny.

Siphon not exposed.

Operculum horny, with an internal shelly coat.

Shell globose, solid; spire small, whorls rounded; aperture oval, entire; inner lip slightly thickened, peritreme simple, acute.

Syn. Ampulloidea, *D'Orb.* Ampullaroides, *Gray.* Asolen, *Agass.* Asolena, *Herm.*

Ex. A. Platæ, *Maton*, pl. 37, fig. 7. Shell, A. Platæ, fig. 7, *a*.

The animal of this genus appears to be without the respiratory siphon so conspicuous in the other genera of the family. It is an inhabitant of the rivers of South America.

Fam. TURRITELLIDÆ.

Lingual membrane minute, very short, teeth in seven series (3·1·3), each series consisting of a subquadrate median tooth, with an incurved denticulated apex, and of three similar, ligulate uncini on each side, all with hamate, serrulated summits. Rostrum short, broad; tentacles long and subulate, the eyes slightly prominent on their external bases. Mantle with a fringed margin, obscurely siphonated at the right side; branchial plume single, very long. Foot very short, truncate in front, rounded behind, grooved beneath; operculigerous lobe simple.

Operculum horny, circular, multispiral, edge of the whorls fimbriated.

Shell spiral, many-whorled; aperture simple in front.

This is strictly a marine group, the species ranging from low-water mark to the depth of 100 fathoms; their geographical distribution extends over most of the countries of the globe, one species being an inhabitant of the British seas. In familiar language they are usually termed "Screw-shells," on account of their peculiar form; in organisation, they appear closely to resemble *Melania* and *Cerithium*. As many as 170 species occur

in a fossil state in the Neocomian formation of Britain, South America, and Australia, and one genus (*Proto*) is altogether extinct.

Genus TURRITELLA, Lamarck.

Shell turreted, subulate, many-whorled, imperforate, whorls rounded, spirally grooved, the suture deep; aperture orbicular, entire in front; outer lip simple, acute.

Syn. Monoceros, *Meusch.*, not *Bloch* or *Lam.* Xylohelix, *Chem.* Terebellum, *Brown*, not *Klein.* Turris, *Humph.*, not *Bolt.* Terebra, *Fabr.*, not *Adans.* Epitonium, *Link.*, not *Bolt.* Aculea, *Perry.* Turritellus, *Montf.*

Ex. T. communis, *Risso*, pl. 38, fig. 1. Operculum, T. terebra, *Linnæus*, fig. 1, *a*, 1, *b*. Shell, T. terebra, fig. 1, *c*.

The shells in this genus are spotted and variegated, generally with red brown; the species inhabit all parts of the world, being, however, most numerous in tropical countries.

Species of Turritella.

annulata, *Kien.*
aquila, *Adams and Reeve.*
bicingulata, *Lam.*
cerea, *Reeve.*
cingulifera, *Sow.*
communis, *Risso.*
cornea, *Lam.*
crocea, *Kien.*
Eschrichtii, *Midd.*
ferruginea, *Reeve.*
flammulata, *Kien.*
lentiginosa, *Reeve.*
maculata, *Reeve.*
nivea, *Gray.*
polaris, *Beck.*
punctata, *Kien.*
sanguinea, *Reeve.*
spectrum, *Reeve.*
terebra, *Linn.*
torulosa, *Kien.*
ungulina, *Linn.*

Sub-gen. HAUSTATOR, Montfort.

Aperture sub-quadrangular; whorls with a broad groove in the middle; outer lip sinuated.

Banksii, *Gray.*
bicolor, *Adams and Reeve.*
Broderipiana, *D'Orb.*
canaliculata, *Adams and Reeve.*
candida, *Reeve.*
columnalis, *Kien.*
conspersa, *Adams and Reeve.*
Cumingii, *Reeve.*
goniostoma, *Valenc.*
Gunnii, *Reeve.*
Hanleyana, *Reeve.*
imbricata, *Linn.*
incisa, *Reeve.*
leucostoma, *Valenc.*
monilifera, *Adams and Reeve.*
multilirata, *Adams and Reeve.*
nodulosa, *King.*
pagodus, *Reeve.*
radula, *Kien.*
rosea, *Quoy and Gaim.*
rubescens, *Reeve.*
sinuata, *Reeve.*
tigrina, *Kien.*
variegata, *Linn.*

Genus TORCULA, Gray.

Shell turreted, subulate, axis imperforate, many-whorled, whorls transversely spirally grooved, the last angulated at the periphery; aperture sub-quadrate, entire and simple anteriorly; outer lip acute, sinuated in the middle.

Syn. Haustator, *Gray*, not *Montf.*

Ex. T. exoleta, *Linnæus*, pl. 35, fig. 2.

In this genus the last whorl is angulated at the base, the form of the mouth of the shell is more or less square, and the whorls are furnished with spiral grooves; many of the species exhibit a peculiar eroded appearance, and are generally devoid of colour.

Species of Torcula.

carinifera, *Lam.*
clathrata, *Kien.*
cochlea, *Reeve.*
congelata, *Adams and Reeve.*
constricta, *Reeve.*
declivis, *Adams and Reeve.*
exoleta, *Linn.*
gemmata, *Reeve.*
Hookeri, *Reeve.*
vittulata, *Adams and Reeve.*

Genus ZARIA, Gray.

Shell imperforate, turreted, elongated, many-whorled, solid, whorls keeled; aperture ovate, produced in front; inner lip with a thin, spreading callus; outer lip acute, sinuated in the middle, produced anteriorly.

Syn. Turritella, *a*, *Schum.*

Ex. Z. duplicata, *Linnæus*, pl. 38, fig. 3. Shell, Z. duplicata, fig. 3, *a*.

The form of the mouth of the shell and the carinated whorls serve chiefly to distinguish this genus, which somewhat resembles *Mesalia* in the texture of the shell; the species are not spotted like those of *Turritella*.

Species of Zaria.

bacillum, *Kien.*
duplicata, *Linn.*
fascialis, *Mke.*
fastigiata, *Adams and Reeve.*
Kaysnaensis, *Krauss.*
replicata, *Linn.*
triplicata, *Stud.*

Genus MESALIA, Gray.

Shell acuminately turreted, many-whorled, whorls convex, transversely striated, the last rounded at the periphery; aperture orbicular, produced anteriorly into a

slight canal, the margin sinuated and reflexed; inner lip somewhat twisted and flattened; outer lip thin, sinuated posteriorly.

Ex. M. brevialis, *Lamarck*, pl. 38, fig. 4. Operculum, M. brevialis, fig. 4, *a*, 4, *b*.

This genus, founded on the *Cerithium Mesal* of Adanson, most nearly resembles the fossil *Proto* of M. Defrance, but the fore part of the aperture is not so decidedly notched, and the last whorl is rounded; the outer lip, moreover, is posteriorly sinuated in *Mesalia*.

Species of Mesalia.

brevialis, *Lam.*
decussata, *A. Adams.*
lactea, *Möll.*
melanoides, *Reeve.*
opalina, *Adams and Reeve.*
striata, *A. Adams.*

Genus EGLISIA, Gray.

Shell elongately turreted, whorls numerous, rounded, with obsolete longitudinal varices, suture depressed; aperture orbicular, small; inner lip flattened, incrassated, angulated at the fore part, not reflexed anteriorly; outer lip thickened internally.

Ex. E. spirata, *Sowerby*, pl. 38, fig. 5.

The animal of this genus is not known; the shells somewhat resemble acuminated species of *Scala*, to which resemblance the rudimentary varices and cancellated whorls contribute; the species are few in number, and are natives of Japan and the Indian Seas.

Species of Eglisia.

Cumingii, *A. Adams.*
lanceolata, *Reeve.*
spirata, *Sow.*
tricarinata, *Adams and Reeve.*

Fam. CÆCIDÆ.

Lingual membrane short; teeth in two series (2·0·2), central denticles none, the lateral uncini with the inner one broad and serrulated. Rostrum long and flat; tentacles short, subclavate at the tips; eyes sessile behind the bases of the tentacles. Mantle thick, fleshy, circular, closely embracing the neck; a single branchial plume. Foot short, narrow, truncate in front, obtuse behind.

Operculum horny, circular, multispiral, concave, or externally conical, edges simple.

The discoverer of the animal of this family, William Clark, observes that it is not at all shy, but shows itself in all its points, marching with great vivacity; it appears to have the greatest affinity with the *Vermetidæ*.

Genus CÆCUM, Fleming.

Shell, when young, discoidal, when adult, decollated, tubular, cylindrical, arcuated; aperture round, entire; apex closed by a mamillated septum, marking the point at which the original spire has been cast off.

Syn. Brochus, *Brown.* Odontidium, *Phil.* Dentaliopsis, *Clark.* Corniculina, *Munster.* Cæcalium, *Macgill.* Odontina, *Zborz.* Odontostoma, *Cantr.*, not *D'Orb.*

Ex. C. trachea, *Montagu*, pl. 38, fig. 6. Shell, C. trachea, fig. 6, *a.*

As may be inferred from the synonymy, this curious little genus has puzzled many Zoologists; among other genera it has been referred to the Pteropodous *Styliola*, and to the extinct, Cephalopodous *Orthoceras;* there are two British species, living in about ten fathoms water.

Species of Cœcum.

diminutum, *C. B. Adams.*
eburneum, *C. B. Adams.*
firmatum, *C. B. Adams.*
glabrum, *Mont.*
læve, *C. B. Adams.*
laqueatum, *C. B. Adams.*
monstrosum, *C. B. Adams.*
parvum, *C. B. Adams.*
pulchellum, *Stimp.*
pygmæum, *C. B. Adams.*
trachea, *Mont.*

Fam. VERMETIDÆ.

Lingual dentition —? Rostrum produced; tentacles short, triangular, eyes small, at their external bases. Mantle with the margin entire, embracing the neck; gills enclosed in a line on the left side of the mantle-cavity. Foot cylindrical, not serving for locomotion, dilated, subclavate, or truncated in front.

Operculum horny, circular, many-whorled, or wanting.

Shell irregularly twisted, tubular, attached, often regularly spiral when young; aperture round.

The Operculum is very large in *Vermetus*, wanting in *Serpulorbis*, very small in *Bivonia*, and singularly developed in *Tenagoda*.

Genus SIPHONIUM, Browne.

Operculum large, smooth, circular, concave; scar central, circular, rugose.

Shell usually fixed, tubular, whorls often carinated, irregular and tortuous; aperture round, peritreme acute, continuous.

Syn. Vermetus, part, *Auct.*

Ex. S. giganteum, *Quoy and Gaimard*, pl. 38, fig. 7. Shell, S. carinatum, *Quoy and Gaimard*, fig. 7, *a*.

Like other members of this family, the animal of this genus is unable to crawl or glide, on account of the shell being fixed, and the foot, not being necessary for locomotion, is, in consequence, rudimentary and obsolete.

Species of Siphonium.

carinatum, *Quoy and Gaim.*
giganteum, *Quoy and Gaim.*
reticulatum, *Quoy and Gaim.*
Tonganum, *Quoy and Gaim.*

Genus VERMETUS, Adanson.

Operculum large, rather concave, whorls very thin, with the external edge produced; scar central, circular, with close, regular, concentric grooves.

Shell tubular, conical, when young, usually spiral, when adult, the whorls more or less disunited, the last prolonged and irregularly twisted; aperture circular, peritreme continuous, acute.

Syn. Serpula, *Scop.*, not *Linn.* Tulaxodes, *Guett.* Scolissedium, *Rein.* Vermicularia, *Lam.* Vermicularius, *Montf.* Conchoserpula, *Blainv.*

Ex. V. lumbricalis, *Linnæus*, pl. 38, fig. 8. Operculum, V. Hindsii, *Gray*, fig. 8, *a*, 8, *b*.

The genus *Vermetus* was first made known as a Gasteropodous Mollusk by the researches of the illustrious

Adanson; the species are inhabitants of tropical seas, but at present are but imperfectly known.

Species of Vermetus.

annulus, *Rouss.*
bicarinatus, *Desh.*
Hindsii, *Gray.*
lumbricalis, *Linn.*
Novæ Hollandiæ, *Rouss.*
Panamensis, *Rouss.*
quadrangulus, *Phil.*
radicula, *Stimp.*
spiratus, *Phil.*
tenuis, *Rouss.*
tulipa, *Rouss.*

Genus BIVONIA, Gray.

Operculum rudimentary, small, ? spiral.

Shell tubular, irregularly twisted, usually adhering in masses; aperture round, peritreme acute, continuous.

Syn. Vermicularia, *b, Schum.*

Ex. B. glomerata, *Bivona*, pl. 39, fig. 1. Operculum, B. glomerata, fig. 1, *a*, 1, *b*. Shell, B. glomerata, fig. 1, *c*.

The operculum is red, convex in the middle, with a thin, flat margin, and a central muscular scar; the shells resemble *Serpulæ,* are irregularly twisted and entwined together in masses, often of considerable size; there are several species, inhabiting the Mediterranean.

Species of Bivonia.

decussata, *Gmel.*
glomerata, *Bivon.*
semisurrecta, *Phil.*
subcancellata, *Phil.*
triquetra, *Phil.*

Genus SERPULORBIS, Sassi.

Foot truncate, radiated at the end, the front part produced into tentacular processes.

Operculum none.

Shell tubular, irregularly twisted, attached; aperture circular, peritreme acute, continuous.

Syn. ? Lementina, *Risso.* Serpuloides, *Gray.* Hatina, *Gray.*

Ex. S. gigas, *Philippi*, pl. 39, fig. 2. Shell, S. gigas, fig. 2, *a.*

The genus *Lementina* of Risso is most probably a badly-observed and incorrectly-figured *S. arenaria*, an inhabitant of the Mediterranean.

Species of Serpulorbis.

arenaria, *Chiaje.*
dentifera, *Quoy and Gaim.*
gigas, *Phil.*
inoperculata, *Rüpp.*
varians, *D'Orb.*

Genus CLADOPODA, Gray.

Foot elongate, front end simple, hinder extremity oblong, clavate, or subtruncate.

Operculum none.

Shell tubular, irregularly subspirally twisted, whorls disunited; aperture round, peritreme acute, continuous.

Syn. Vermetus, sp. *Quoy and Gaimard.*

Ex. C. arenaria, *Quoy and Gaimard*, pl. 39, fig. 3. Shell, C. Quoyi, *H. and A. Adams*, fig. 3, *a.*

In this genus, the species of which are chiefly from

New Zealand, the operculum is wanting, and the foot is produced and club-shaped, with the front part simple.

Species of Cladopoda.

arenaria, *Quoy and Gaim.*
elegans, *Quoy and Gaim.*
grandis, *Quoy and Gaim.*
Novæ Zealandiæ, *Quoy and Gaim.*
Quoyi, *H. and A. Adams.*

Genus SPIROGLYPHUS, Daudin.

Animal forming a groove on the surface of other shells or stones, covering it over with shelly matter, and forming a tubular case.

Shell tubular; apex subspiral, whorls disunited and irregularly contorted, partly imbedded in stones or shells.

Ex. S. spirorbis, *Dillwyn*, pl. 39, fig. 4.

Many Zoologists consider the *Spiroglyphus* to be an Annulose animal allied to *Serpula*, but of this there is no positive proof. The young animal, when first hatched, is covered with an ovate, regular shell, consisting of a whorl and a half; it soon attaches itself to the surface of some stone or other shell, in which it forms a canal, at first shallow, but afterwards deeper.

Genus TENAGODA, Guettard.

Foot with the end truncate and circular.

Operculum cyrindrical, formed of a horny lamina, rolled spirally, about five times, on its axis.

Shell tubular, cylindrical, irregularly twisted; apex subspiral, whorls with an articulated fissure extending along the upper part; aperture circular.

Syn. Siliquaria, *Brug.*, not *Forsk.* or *Gray.* Siliquarius, *Montf.* Agathirses, *Montf.*

Ex. T. anguina, *Linnæus*, pl. 39, fig. 5. Operculum, T. anguina, fig. 5, *a*, 5, *b*, 5, *c*. Shell, T. anguina, fig. 5, *d*.

This genus was formerly regarded as an Annelid; its Molluscous nature was first demonstrated by M. Audouin. The typical species is found in the Mediterranean, imbedded in the Sponges with silicious spicula.

Species of Tenagoda.

anguina, *Linn.*
australis, *Quoy and Gaim.*
lactea, *Lam.*
lævigata, *Lam.*
muricata, *Born.*
polygona, *Blainv.*
rosea, *Quoy and Gaim.*
squamata, *Blainv.*

Fam. ONUSTIDÆ.

Lingual dentition — ? Rostrum elongated, subcylindrical, tapering; tentacles subulate, with the eyes sessile on their outer bases. Mantle-margin simple in front; branchial plume single. Foot small, cylindrical, used for jumping, not walking, divided into a front expanded, and a hind tapering portion.

Operculum large, horny, subannular, right half free, nucleus lateral, dextral; muscular impression sinistral, semilunar, extending the whole length.

Shell trochiform; aperture simple in front.

When these animals progress, they scramble along like the Strombs, and often extending and fixing the front dilated part of the foot, draw the hind lobe up to it, and then make another step, throwing forwards the shell at every movement; they cannot glide like most other

Mollusks, but the form of their foot is admirably adapted to the nature of the floor on which they live, which is usually composed of the débris of dead shells.

Genus ONUSTUS, Humphrey.

Operculum sub-quadrate, elements elevated on the upper surface at regular intervals, forming continuous ridges radiating from the lateral nucleus.

Shell trochiform, depressed, whorls flat, with foliaceous or stellated margins, covered with fragments of shells and stones near the sutures and apex, periphery surrounded with tubular spines or radiating processes; umbilicus wide and deep; outer lip much produced above, receding far beneath.

Ex. O. exutus, *Reeve*, pl. 40, fig. 1. Operculum, O. exutus, fig. 1, *a*, 1, *b*. Shell, O. solaris, *Linnæus*, fig. 1, *c*.

The thin, produced margins of the whorls, the wide and deep umbilicus, and the very peculiar operculum, serve to distinguish this genus.

Species of Onustus.

calculiferus, *Reeve.*
exutus, *Reeve.*
Indicus, *Mart.*
solaris, *Linn.*

Genus XENOPHORA, Fischer.

Operculum thin, ovate, elements simple, subannular, nucleus lateral.

Shell trochiform, concave beneath, irregular, whorls flat, more or less concealed by fragments of shells and stones; spire depressed; aperture wide; umbilicus small.

Syn. Phorus, *Montf.* Xenophorus, *Phil.*

Ex. X. solarioides, *Reeve*, pl. 40, fig. 2. Operculum, X. solarioides, fig. 2, *a*, 2, *b*. Shell, X. trochiformis, *Born*, fig. 2, *c*.

The "Carriers" inhabit deep water, and are most numerous in the Java and China Seas. Each species appears to have its own peculiar method of collecting the fragments of shells and stones which cover the ground where it lives, and each cements to the outside of the shell its particular kind of materials. The adventitious pieces of shell are so disposed as not to curve downwards beyond the edge of the shell so as to impede the progress of the animal, but are usually placed with their concave sides uppermost.

Species of Xenophora.

cerea, *Reeve.*
corrugata, *Reeve.*
pallidula, *Reeve.*
solarioides, *Reeve.*
trochiformis, *Born.*

Fam. CALYPTRIDÆ.

Lingual dentition as in *Capulidæ*. Head large, transverse; muzzle slightly produced, furnished anteriorly with buccal appendages; tentacles short, subulate, eyes small, on bulgings at their external bases. Mantle considerably developed, lining the shell, simple-edged in front; branchial plume single, placed obliquely across the mantle-cavity. Foot flat, expanded.

Operculum none.

Shell patelliform; apex more or less spiral (in the

young regularly spiral); aperture wide, with an internal testaceoüs appendage.

Like the animals of *Capulidæ*, the members of this family carry and hatch their spawn under the neck, in front of the foot. The simple nature of their pedal disk, and the internal testaceous appendage of the shell, tend to preserve them as a distinct group. The use of the calcareous lamina, which is the first stage in the formation of a columella, is to support the viscera and separate them from the foot or locomotive organ, as the *Calyptridæ* have greater powers of locomotion than the *Capulidæ* or the *Patellidæ* (Owen).

Genus CALYPTRA, Humphrey.

Foot large, sub-triangular.

Shell conical, sub-acuminated, supported upon a solid, calcareous, basal plate; apex subcentral, a little posterior, with a minute, spiral nucleus; aperture with the internal appendage half-cup-shaped, open in front, on the posterior side, attached to the apex.

Syn. Calyptræa, *Lam.* Calyptrus, *Montf.* Calyptria, *Owen.* Mitrularia, *Schum.* Lithedaphus, Litholepas, *Owen.*

Ex. C. equestris, *Linnæus*, pl. 40, fig. 3, 3, *a*.

Calyptra, like *Cochlolepas*, is furnished with a calcareous plate, secreted by the foot, by means of which it is fixed to rocks and the under surface of stones, a discovery made by Mr. Cuming, who found, on turning over some large stones partly buried in the sand, several living individuals affixed to the under side; these specimens were described as a new genus by Professor Owen under

the name of *Lithedaphus*. The form of the internal testaceous appendage, adhering at the base, with the sides free, and semiconical, as if longitudinally divided, will at once distinguish the genus from all the others of the family; the surface of the shell is rugose or cancellated; the species are found in all parts of the world.

Species of Calyptra.

cepacea, *Brod.*
chlorina, *Gould.*
cornea, *Brod.*
corrugata, *Brod.*
depressa, *Adams and Reeve.*
equestris, *Linn.*
planulata, *C. B. Adams.*
tectum-Sinense, *Chem.*
varia, *Brod.*

Genus CRUCIBULUM, Schumacher.

Buccal appendages obtuse and truncate; foot circular.

Shell subconic; apex subcentral; aperture wide, with the internal appendage entire and cup-shaped, attached by one of its sides.

Syn. Biconia, *Swains.* Bicatillus, *Swains.* Calypeopsis, *Brod.*, not *Less.*

Ex. C. rugosum, *Deshayes*, pl. 40, fig. 4. Shell, C. extinctorum, *Sowerby*, fig. 4, *a.*

The species of this genus, which is distinguished from *Calyptra* by the entire, cup-like inner appendage, are generally found attached to other shells; they are chiefly natives of Western America and the West Indian Islands.

Species of Crucibulum.

auriculatum, *Sow.*
extinctorum, *Sow.*
fastigiatum, *Gould.*
hispidum, *Brod.*
imbricatum, *Brod.*
maculatum, *Brod.*
peziza, *Gray.*
pileolus, *D'Orb.*
pileopsis, *Quoy and Gaim.*
radiatum, *Brod.*
rugosum, *Desh.*
spinosum, *Sow.*
Tonganum, *Quoy and Gaim.*
trigonale, *Adams and Reeve.*
umbrella, *Desh.*
undulatum, *Mart.*
Vanicorense, *Quoy and Gaim.*

Sub-gen. DISPOTÆA, Say (Calypeopsis, *Less.*).

Internal appendage entire, cup-shaped, laterally adherent.

cancellata, *Adams and Reeve.* striata, *Say.*

Genus TROCHITA, Schumacher.

Foot transversely oblong, bilobed at the middle in front.

Shell orbicular, trochiform, more or less spiral; apex central, whorls convex, radiately rugosely plicate, axis imperforate; aperture wide, with an oblique, transverse, subspiral lamina, simple on the columellar margin.

Syn. ? Luna, *Klein.* Infundibulum, *D'Orb.*, not *Montf.* Trochatella, *Less.*, not *Swains.*

Ex. T. occidentalis, *Gray*, pl. 40, fig. 5. Shell, T. radians, *Lamarck*, fig. 5, *a.*

The apex of the cone in this genus assumes a more or less spiral form, and the internal lamina of the aperture is partly twisted, and partakes of the character of a rudi-

mentary columella. The species are principally natives of the shores of South America.

Species of Trochita.

Lamarckii, *Desh.*
occidentalis, *Gray.*
radians, *Lam.*
spirata, *Forbes.*

Sub-gen. HALIOTIDEA, Swainson (not *Humphrey*).

Shell umbilicated; spire excentric, usually of two whorls, and placed latero-posteriorly, whorls rounded, simple, not radiately plicate.

comma-notata, *Sow.*
dilatata, *Sow.*

Genus GALERUS, Humphrey.

Muzzle bilabiate, buccal appendages short, rounded; a slightly-developed plain-edged neck-lobe; foot auriculate in front.

Shell depressly conical; apex vertical, produced, subspiral, nearly central, whorls flattened, smooth, ribbed or spinose; aperture deep, with the internal appendage entire, subspiral, lateral, and adherent; the columellar edge folded back on itself, forming a false umbilicus; the front edge produced.

Syn. ? Ancile, *Meusch.* Mitella, *D'Argenville*, *Leach*, not *Oken.* Mitrula, *Gray.* Trochilla, *Swains.* Infundibulum, *J. Sow.*, not *D'Orb.* or *Montf.* Sigapatella, *Less.* Siphopatella, *Less.*

Ex. G. Chinensis, *Linnæus*, pl. 40, fig. 6. Shell, G. Chinensis, fig. 6, *a.*

The inner testaceous lamina is fixed at the outer margin, and free and recurved at its inner edge, where it often is folded back and forms a false umbilicus, or it is thickened, and forms a rudimentary columella.

Species of Galerus.

aberrans, *C. B. Adams.*
apertus, *Brand.*
aspersus, *C. B. Adams.*
Chinensis, *Linn.*
conchaguus, *C. B. Adams.*
conicus, *Brod.*
lichen, *Brod.*
mamillaris, *Brod.*
regularis, *C. B. Adams.*
serratus, *Brod.*
sordidus, *Brod.*
striatus, *Brod.*
unguis, *Brod.*

Genus CRYPTA, Humphrey.

Head large, transverse, depressed; foot rounded, slightly truncate in front.

Shell ovate or oblong; apex posterior, oblique, submarginal; aperture elongated, polished within, the posterior half covered by a horizontal testaceous lamina, edge of lamina rather straight.

Syn. Crepidula, *Lam.* Crepidulus, *Montf.* Sandalium, *Schum.* Proxenula, *Perry.* Lephyrobolus, *Schlüt.*

Ex. C. aculeata, *Chemnitz*, pl. 40, fig. 7. Shell, C. fornicata, *Linnæus*, fig. 7, *a.*

The chief locality for *Crypta* is South America; but they also inhabit the West Indies, Australia, China, Senegal, and the Mediterranean; they are found adhering to the rocks, and, according to Adanson, seem to prefer those places where the sea beats with the greatest violence; some species, according to the same observer, adhere to

the shells which remain concealed in the sand; they often live in groups, attaching themselves to the outside of each other's shells.

Species of Crypta.

adspersa, *Dkr.*
adunca, *Say.*
arenata, *Brod.*
calyptræiformis, *Desh.*
Capensis, *Quoy.*
cerithicola, *C. B. Adams.*
contorta, *Quoy and Gaim.*
convexa, *Say.*
costata, *Sow.*
costellata, *Dkr.*
excavata, *Brod.*
fornicata, *Linn.*
Gorëensis, *Gmel.*
grandis, *Midd.*
incurva, *Brod.*
lineolata, *Desh.*
lingulata, *Gould.*
marginalis, *Brod.*
minuta, *Midd.*
Moulinsii, *Mich.*
nivea, *C. B. Adams.*
onyx, *Sow.*
osculans, *C. B. Adams*
patula, *Desh.*
porcellana, *Linn.*
Peruviana, *Lam.*
rostrata, *C. B. Adams.*
rugosa, *Nutt.*
Rusei, *Dkr.*
Sitchana, *Midd.*
solida, *Hinds.*
strigellata, *Dkr.*

Sub-gen. CREPIPATELLA, Lesson.

Internal lamina rounded, produced; apex of shell lateral, incurved, sub-terminal.

aculeata, *Chem.*
Adolphei, *Less.*
dilatata, *Lam.*
dorsata, *Brod.*
echinus, *Brod.*
hepatica, *Desh.*
hystrix, *Brod.*
pallida, *Brod.*
rugulosa, *Dkr.*
strigata, *Brod.*

Sub-gen. IANACUS, Mörch (not Inachus, *Hising.* or *Fabr.*).

Shell depressed; apex postical, laterally inclined; internal

septum with an impressed groove at the columellar margin, edge of septum incised internally.

excisa, *Phil.*
exuviata, *Nutt.*
glauca, *Brod.*
Lessonii, *Brod.*
pedum, *Mörch.*
plana, *Say.*
squama, *Brod.*
uncata, *Mke.*
unguiculus, *Sow.*
unguiformis, *Lam.*

Sub-gen. ERGÆA, H. and A. Adams.

Shell depressed; apex lateral; internal lamina flat, produced anteriorly, with a tubular rib at the columellar margin.

plana, *Adams and Reeve.*
Walshi, *Herm.*

Fam. CAPULIDÆ.

Tongue-membrane winged on each side in front, teeth arranged in seven series (3·1·3), central teeth small and broad, with the apex hooked, the lateral teeth long and hamate. Rostrum lengthened; tentacles subulate, with the eyes on bulgings at their outer bases. Mantle simple in front; gill forming a single plume placed obliquely across the mantle-cavity, laminæ elongate, linear, partly exposed. Foot folded on itself, the sides simple, anteriorly thin and strap-shaped, posteriorly thick, orbicular, and concave.

Operculum none.

Shell limpet-like; apex subspiral, in the young, regularly spiral; aperture with the interior simple; muscular impression horse-shoe shaped.

These animals are said to feed on the sea-weed that

grows around them, and on small marine organisms; they are inhabitants of nearly all the countries of the world, and appear to be possessed of but limited locomotion, being generally observed adhering to stones and to other shells, the margins of the aperture becoming modified according to the surface on which they live, as in the genus *Capulus;* sometimes, however, they wear away the space beneath their foot, forming shallow excavations, as in *Amalthea;* or they secrete a shelly base by means of the same organ, as in *Cochlolepas.* The egg-cases in this family are membranous, and are attached in a tuft at the front of the foot under the neck.

Genus CAPULUS, Montfort.

Mantle fringed at the margin; foot strong, orbicular, sides plain.

Shell conical; surface striated, usually covered with a horny epidermis; apex inclined posteriorly, recurved, sub-spiral; aperture dilated.

Syn. Pileopsis, *Lam.* Galerita, *Brongn.* Actita, *Fisch.* Spiracella, *Rang* (young). Acroculia, *Phillips.*

Ex. C. Ungaricus, *Linnæus*, pl. 41, fig. 1. Shell, C. Ungaricus, fig. 1, *a.*

In *Capulus* the mantle-margin is fringed, and the foot is circular; the animal is rather sluggish and sedentary, and sometimes secretes an imperfect shelly disk from its foot, showing its affinity to *Cochlolepas.* The name *Galerita* has priority over that of *Capulus*, but had been previously applied by Fabricius to a genus of Beetles.

Species of Capulus.

militaris, *Linn.*
paleaceus, *Mke.*
pilosus, *Desh.*
radiatus, *Sars.*
sagittiferus, *Gould.*
Ungaricus, *Linn.*

Sub-gen. THYCA, H. and A. Adams.

Shell crystalline, acutely conical, slightly curved, longitudinally grooved; parasitic on star-fishes.

asterícola, *Adams and Reeve.*
crystallinus, *Gould.*

Genus AMATHINA, Gray.

Head elongated; eyes sessile on the posterior lateral margins behind the tentacles; tentacles short, obtuse; mantle-margin entire, a tentacular median filament at the hind part.

Shell somewhat depressed, surface with prominent, diverging, longitudinal ribs; apex recurved posteriorly and contorted; aperture large, expanded, oblong, emarginate anteriorly.

Ex. A. tricarinata, *Chemnitz*, pl. 41, fig. 2, 2, *a*. Shell, A. tricarinata, fig. 2, *b*.

Amathina differs from *Capulus* in having prominent longitudinal ridges in front of the shell, which is never covered with epidermis. The animal, which we have examined from a specimen in spirits, in Mr. Cuming's collection, has a very long head, with the eyes sessile at the sides behind the base of the tentacles, and there is a peculiar tapering filament, situated centrally, at the posterior extremity of the mantle.

Genus COCHLOLEPAS, Klein.

Sole of foot with a crescentic muscular impression.

Shell thick, obliquely conical; apex posterior, non-spiral; muscular impression of the foot on a shelly plate distinct from the substratum.

Syn. Hipponyx, *Defr.* Cochlearia, *Klein*, not *Linn.* or *Munst.*

Ex. C. radiata, *Quoy and Gaimard*, pl. 41, fig. 3. Shell, C. antiquata, *Linnæus*, fig. 3, *a*, 3, *b*.

This genus is known from *Amalthea* of Schumacher by the distinct shelly base formed by the foot of the animal, which leaves an impression of a horse-shoe shape, similar to that of the mantle on the shell. The species occur, usually attached to living shells, in the Eastern Seas and in Western America.

Species of Cochlolepas.

acuta, *Quoy and Gaim.*
antiquata, *Linn.*
barbata, *Sow.*
foliacea, *Quoy and Gaim.*
granulosa, *A Adams.*
imbricata, *Gould.*
radiata, *Quoy and Gaim.*
subrufa, *Mart.*
Ticaonica, *Sow.*
trigona, *Gmel.*

Genus AMALTHEA, Schumacher.

Buccal appendages moderate, slightly exserted; sole of foot with a crescentic muscular impression.

Shell pointed, conical; apex posterior, non-spiral; aperture wide, oval; muscular impression of foot on the substratum itself.

Syn. Sabia, *Gray.*

Ex. A. australis, *Quoy and Gaimard*, pl. 41, fig. 4.

A. conica, *Schumacher*, fig. 4, *a*. Shell, A. conica, fig. 4, *b*, 4, *c*.

This genus is like *Cochlolepas*, but it simply excavates with its foot a superficial cavity in the surface of the shell or stone on which it fixes itself, not forming a shelly plate distinct from the substratum.

Species of Amalthea.

australis, *Quoy and Gaim.* Panamensis, *C. B. Adams.*
conica, *Schum.*

Fam. VANIKORIDÆ.

Lingual dentition—? Rostrum moderate; tentacles elongate, subulate, dilated in the middle; eyes sessile on the outer bases of the tentacles. Mantle-margin included, simple in front. Foot small, circular, with a dilated, membranous, wing-like expansion on each side, and produced in front into a narrow, strap-shaped, truncated lobe.

Operculum thin, horny, ovate, nonspiral.

Shell white, spiral, last whorl large; aperture entire in front.

These animals are littoral in their habits, being found adhering to stones at low-water. (Cuming.) In their general appearance the shells resemble those of the *Velutinidæ*, but the animal is very different.

Genus VANIKORO, Quoy and Gaimard.

Shell thin, white, spiral, often covered with a velvety epidermis; spire short, whorls few, rounded, irregularly

ribbed, cancellated or spirally striated; axis perforated, umbilicus ending in a distinct, arched canal behind the inner lip; inner lip simple; aperture semilunar, more or less modified by the last whorl.

Syn. Merria, *Gray*: Narica, *Recluz*. Nioma, *Gray*. Leucotis, *Swains*. Vanicoro, *Gray*.

Ex. V. cancellata, *Quoy and Gaimard*, pl. 41, fig. 5, 5, *a*. Operculum, V. cancellata, fig. 5, *b*, 5, *c*. Shell, V. cancellata, fig. 5, *d*.

This genus was named by the Naturalists of the "Astrolabe" after Vanikoro, one of the Pacific Islands, where they first discovered it; afterwards, however, they erroneously regarded it as a *Sigaretus*.

Species of Vanikoro.

acuta, *Recluz*.
Blainvilliana, *Recluz*.
cancellata, *Chem*.
cidaris, *Recluz*.
clathrata, *Recluz*.
Cumingiana, *Recluz*.
Cuvieriana, *Recluz*.
Deshayesiana, *Recluz*.
distans, *Recluz*.
Gaimardi, *H. and A. Adams* (Quoyi, *A. Adams*).
granulosa, *Recluz*.
Gueriniana, *Recluz*.
helicoidea, *Le Guillou*.
lamellosa, *D'Orb*.
ligata, *Recluz*.
Mauritiæ, *Recluz*.
Orbignyana, *Recluz*.
Petitiana, *Recluz*.
plicata, *Recluz*.
Quoyi, *Recluz*.
rosea, *Recluz*.
rugata, *A. Adams*.
sigaretiformis, *Potiez*.
Souleytiana, *Recluz*.
striata, *D'Orb*.
sulcata, *D'Orb*.

Genus NERITOPSIS, Grateloupe.

Shell spiral, obovate, white, solid; spire short, whorls rounded, cancellated; aperture semilunar; inner lip thick, rather flat, with a large, square notch in the middle; outer lip internally thickened and grooved.

Syn. Radula, *Gray*, not *Klein*.

Ex. N. radula, *Linnæus*, pl. 41, fig. 6.

The animal of this genus is not known, but from the peculiar white appearance and sculpture of the shell it appears to belong to this family; from the operculum never having been met with, it is probably very thin, and has escaped the notice of collectors. The recent species is from the Pacific, and there are about twenty fossil species.

Order SCUTIBRANCHIATA.

Gill consisting of two series of lamellæ, forming one or two series over the back of the neck, or on the under edge of the mantle, round the foot. Animal hermaphrodite. Shell spiral, or symmetrical and conical.

The Scutibranchiate Gasteropods comprise a vast assemblage of Mollusks, all marine, and chiefly littoral in their habits, living upon the sea-weed covering the rocks along the shore. They are hermaphrodite and self-impregnating, the sexes not being separate in different individuals, as in the Pectinibranchs. In the *Neritidæ*, *Trochidæ*, and *Fissurellidæ* the heart is traversed by the rectum, while in the *Tecturidæ*, *Gadiniidæ*, *Patellidæ*, and *Chitonidæ*, the heart is separate from the rectum.

Some of the families have the eyes on peduncles separate from the tentacles, and the sides of the foot furnished with a continuous fringe bearing tentacular filaments, as the *Trochidæ;* the *Neritidæ* have pedunculated eyes, but want the lateral fringe; while in the *Fissurellidæ* the eyes are sessile, and the lateral fringe is rudimentary. The gills are usually in one or two series over the back of the neck, but in the *Patellidæ* and *Chitonidæ* they are under the edge of the mantle round the foot. The shell is spiral in the *Neritidæ* and *Trochidæ;* patelliform in the *Fissurellidæ*, *Gadiniidæ*, *Tecturidæ*, and *Patellidæ;* and composed of several pieces in the *Chitonidæ*.

Sub-order PODOPHTHALMA.

Eyes pedicelled, pedicels separate from the tentacles; teeth numerous, the lateral uniform, very numerous, crowded. Shell and operculum spiral.

Fam. NERITIDÆ.

Lingual dentition very similar to that of the *Trochidæ*, the central teeth few, the lateral hooks, or uncini, very numerous. Head with a broad, short muzzle; tentacles slender and subulate, with the eyes on stout peduncles at their outer bases; no head-lobes or neck-lappets. Foot oblong, triangular, the sides simple, without filaments or lateral membrane.

Operculum articulated, shelly, sub-spiral.

Shell depressed or oval, not umbilicated; spire very short, cavity simple, from the absorption of the inter-

nal portions of the whorls; aperture semi-ovate, not pearly within.

In this tribe of Scutibranchiate Mollusks the sides of the foot are without membranous fringes and tentacular filaments, the animal is not voluminous, and the foot is small and never envelopes the shell; in their dental system they resemble the *Trochidæ*, as also in their muzzle-shaped heads and pedunculated eyes. They are littoral animals, inhabiting the stones and rocks along the shore, feeding on the algæ that abound in that situation. They appear to be more active during the night, resembling, in this respect, the *Patellidæ*, which are said to enjoy considerable locomotive powers at that time.

Genus NERITA, Linnæus.

Animal with the mantle-margin festooned.

Operculum horny, solid, with a shelly coat on each side, the outer surface usually granular, when smooth, with circular grooves, the edge channelled.

Shell generally solid, thick, semi-globose, smooth or spirally grooved, often covered with a horny epidermis; aperture semilunar; inner lip broad, flattened, the front edge straight, with a few very prominent teeth; outer lip thickened, dentate, crenulate or grooved internally.

Syn. Odontostoma, *Klein*, not *D'Orb.* Neritarius, *Dum.*

Ex. N. polita, *Linnæus*, pl. 42, fig. 1. Operculum, N. polita, fig. 1, *a*, 1, *b*. Shell, N. polita, fig. 1, *c*.

The Nerites proper may be known at once from the sub-genera by the septiform plane of the inner lip being smooth or nearly smooth. All the species are

marine, and they are principally inhabitants of warm and tropical countries; they are littoral in their habits, living on the rocks and stones, and are said to be most active during the night, when they roam about, feeding on the algæ; their eggs are ovate, covered with a horny skin, and attached to other shells.

Species of Nerita.

Aurora, *Dkr.*
australis, *Gray.*
Chemnitzii, *Recluz.*
dens-sanguineus, *Chem.*
Doreyana, *Quoy and Gaim.*
fasciata, *Meusch.*
flava, *Meusch.*
flavescens, *Chem.*
Forskaalii, *Recluz.*
Georgina, *Recluz.*
Guamensis, *Quoy and Gaim.*
hieroglyphica, *Chem.*
histrio, *Linn.*
incerta, *V. d. Busch.*
insculpta, *Recluz.*
Kiset, *Adanson.*
lineata, *Linn.*
olivaria, *Le Guillou.*
Orbignyana, *Recluz.*
Pacifica, *Recluz.*
Peruviana, *Phil.*
polita, *Linn.*
radiata, *Recluz.*
Rumphii, *Recluz.*
tenebrosa, *Recluz.*
Umlaasia, *Krauss.*

Sub-gen. PILA, Klein (Peloronta, *Oken*).

Septiform plane of inner lip rugose; outer lip internally dentate.

antiquata, *Recluz.*
aurantia, *Recluz.*
chrysostoma, *Recluz.*
corrosula, *Reclux.*
costata, *Gmel.*
costulata, *V. d. Busch.*
crassa, *Gould.*
Essingtoni, *Recluz.*
flammulata, *Recluz.*
grossa, *Linn.*
Lagar, *Adanson.*
Le Guillouana, *Recluz.*
maculifera, *Le Guillou.*
maxima, *Chem.*
multijugis, *Mke.*
musiva, *Gould.*
Novæ Guineæ, *Less.*
Novæ Hiberniæ, *Less.*

ornata, *Sow.*
Papuana, *Recluz.*
peloronta, *Linn.*
plicata, *Linn.*
scabricosta, *Lam.*
Selot, *Adanson.*
striata, *Martyn.*
trifasciata, *Le Guillou.*
undulata, *Gmel.*
variegata, *Chem.*
venusta, *Dkr.*
Winteri, *Phil.*

Sub-gen. THELIOSTYLA, Mörch.

Septiform plane of inner lip granular or tubercular.

albicella, *Linn.*
anthracina, *V. d. Busch.*
Argus, *Recluz.*
atrata, *Chem.*
Bernhardi, *Recluz.*
bizonalis, *Lam.*
Chamæleon, *Linn.*
chlorostoma, *Lam.*
diversicolor, *Martyn.*
Dombeyi, *Recluz.*
Dumar, *Adanson.*
exuvia, *Linn.*
fulgurans, *Gmel.*
Largillierti, *Phil.*
Longii, *Recluz.*
marginata, *Gmel.*
morio, *Sow.*
nigerrima, *Chem.*
ocellata, *Le Guillou.*
oryzarum, *Recluz.*
petechialis, *Meusch.*
picea, *Recluz.*
planospira, *Anton.*
plexa, *Chem.*
reticulata, *Karsten.*
squammulata, *Le Guillou.*
Tadin, *Adanson.*
varia, *Meusch.*
Yoldii, *Recluz.*

Genus NERITELLA, Humphrey.

Operculum testaceous, the outer surface smooth, with two apophyses, the upper shorter, sometimes dilated and crested, the lateral in the form of an arched rib.

Shell globose, oval, turriculated or conical, thin, often depressed, covered with a horny epidermis; aperture semilunar; inner lip straight, flattened, the margin smooth or denticulated; outer lip simple internally.

Syn. Neritina, *Lam.* Clypeolum, *Recluz.* Nereina, *Crist. and Jan.* Lamprostoma, *Rafin.*, not *Swains.* Chernites, *Gistel.*

Ex. N. pulligera, *Linnæus*, pl. 42, fig. 2. Operculum, N. pulligera, fig. 2, *a*, 2, *b*. Shell, N. pulligera, fig. 2, *c*.

The *Neritellæ* are tolerably numerous in species; they are inhabitants of fresh water, and are usually covered with an epidermis; some among them are found crawling on the stones in shallow water, others live in deeper water, half buried in the mud, some in brackish, and others even in salt water; some are amphibious, clinging to the roots of Nipah palms and other trees on the margins of rivers, while a few inhabit the foliage of tall trees that overhang ponds and rivulets. The genus *Neritella*, as restricted, is characterised by the shell being transverse, elliptical, or hemispherical; the spire lateral or none; the inner lip septiform, flattened, and striolate, with the margin finely denticulate: with one or two exceptions, they are not found in the frigid or temperate zones, but are extensively distributed in every other part of the world.

Species of Neritella.

asperulata, *Recluz.*
Beckii, *Recluz.*
bicanalis, *Phil.*
canalis, *Sow.*
cholerica, *Gould.*
Knorri, *Recluz.*
labiosa, *Sow.*
pennata, *Born.*
Petitii, *Recluz.*
porcata, *Gould.*
Powisiana, *Recluz.*
pulligera, *Linn.*
punctulata, *Lam.*
Rossmässleriana, *Recluz.*
rubella, *Müll.*
sanguinea, *Sow.*
squamæpicta, *Recluz.*

Sub-gen. NERITINA, Swainson (Clithon, *Recluz*).

Shell globular, oval or turriculated, smooth or spirally striated, often adorned with vivid and varied colours; inner lip septiform, crenulated, rarely simple.

Adansoniana, *Recluz.*
affinis, *Recluz.*
apiata, *Recluz.*
arctilineata, *Sow.*
aterrima, *Phil.*
bella, *Phil.*
cassiculum, *Sow.*
chrysocolla, *Gould.*
Cochinsinæ, *Recluz.*
communis, *Quoy.*
cornea, *Linn.*
Cumingiana, *Recluz.*
Cuvieriana, *Recluz.*
Desmoulinsiana, *Recluz.*
dubia, *Chem.*
elegantissima, *V. d. Busch.*
Gaimardii, *Souleyet.*
gagates, *Lam.*
granis, *Morel.*
Guerinii, *Recluz.*
Jovis, *Recluz.*
Listeri, *Pfeiff.*
litturata, *Recluz.*
lugubris, *Lam.*
microstoma, *D'Orb.*
Moquiniana, *Recluz.*
nebulata, *Recluz.*
nux, *Brod.*
Oualaniensis, *Less.*
Pfeifferi, *Recluz.*
phasiana, *Recluz.*
plumbea, *Recluz.*
ramosa, *Meusch*
reclinata; *Say.*
Royssii, *Recluz.*
Sayana, *Recluz..*
semiconica, *Lam.*
serrulata, *Recluz.*
Smithii, *Gray.*
sobrina, *Recluz.*
strigillata, *Recluz.*
striolata, *Recluz.*
triangularis, *Meusch.*
tristis, *D'Orb.*
turbida, *Morel.*
turrita, *Chem.*
variegata, *Less.*
vestita, *Souleyet.*
Waigiensis, *Less.*
Wallisiarum, *Recluz.*
Webbei, *Recluz.*
Zealandica, *Recluz.*
zebra, *Brug.*

Sub-gen. VITTA, Klein (Theodoxus, *Montf.* Elea, *Ziegl.*).

Shell transverse, smooth or nearly smooth; spire lateral, inclined over the aperture, more or less prominent; inner lip

usually flat, with the margin simple or denticulated; operculum uniform, without coloured zones.

Anatensis, *Recluz.*
Bensoni, *Recluz.*
Bœtica, *Lam.*
Bourguignati, *Recluz.*
callosa, *Desh.*
Ceylanensis, *Recluz.*
chlorina, *Link.*
Colombana, *Recluz.*
cornucopia, *Bens.*
Danubialis, *Linn.*
elliptica, *Le Guillou.*
elongatula, *Morel.*
fluviatilis, *Linn.*
intexta, *Villa.*
inquinata, *Morel.*
Jayana, *Recluz.*
Matoniana, *Risso.*
meridionalis, *Phil.*
minima, *Le Guillou.*
Mittreana, *Recluz.*
nigrita, *Ziegl.*
Numidica, *Recluz.*
obtusa, *Bens.*
Panayana, *Recluz.*
Peloponensis, *Recluz.*
Perotitiana, *Recluz.*
picta, *Sow.*
Prevostiana, *Férus.*
pulchella, *Wood.*
pupa, *Linn.*
Rangiana, *Recluz.*
reticularis, *Sow.*
serratilinea, *Sow.*
siderea, *Gould.*
Siquijorensis, *Recluz.*
strangulata, *Mühlf.*
succinea, *Recluz.*
thermalis, *Boubé.*
trabalis, *Meusch.*
transversalis, *Ziegl.*
trifasciata, *Mke.*
turricula, *Mke.*
virginea, *Linn.*
viridis, *Linn.*
zebrina, *Recluz.*

Sub-gen. DOSTIA, Gray (Sandaliformes, Mitrula, *Mke.*).

Shell slipper-shaped, solid; apex entirely posterior, rolled in a half-turn on the side; peritreme continuous and free; inner lip septiform, the margin united to the inner portion of the peritreme, slightly arched in the centre, and denticulated.

crepidularia, *Lam.*
depressa, *Bens.*
exaltata, *Recluz.*
melanostoma, *Trosch.*
ovalis, *Sow.*
Phrygia, *Meusch.*
pileolus, *Recluz.*
Touraunensis, *Souleyet.*

Sub-gen. ALIMA, Recluz.

Shell depressed, sub-orbicular, with the upper extremity of the outer margin prolonged into a lateral wing; spire sub-posterior and lateral; inner lip septiform, margin finely denticulate.

æquinoctialis, *Morel.*
Bahiensis, *Phil.*
globosa, *Sow.*
granosa, *Sow.*
intermedia, *Sow.*
Jordani, *Sow.*
latissima, *Brod.*
Nuttallii, *Recluz.*
Oweniana, *Gray.*

Sub-gen. NERIPTERON, Lesson.

Shell catilliform, with the two extremities of the outer margin prolonged into lateral auricles; spire sub-posterior and lateral; inner lip septiform; margin finely denticulate.

auriculata, *Lam.*
biauriculata, *Recluz.*
dilatata, *Brod.*
florida, *Recluz.*
Lamarckii, *Desh.*
Mauritiæ, *Less.*
navicularis, *Mörch.*
subauriculata, *Recluz.*
Tahitensis, *Less.*

Genus CLITHON, Montfort.

Shell sub-globose or sub-orbicular, whorls usually crowned with spines; aperture semilunar; inner lip septiform and denticulate, one of the median teeth always stronger and more prominent than the others, obtuse, and forming a spiral internal ridge; outer lip more or less emarginate in the middle.

Syn. Cliton, *Less.* Corona, *Recluz.*

Ex. C. diadema, *Recluz*, pl. 42, fig. 3. Operculum, C. diadema, fig. 3, *a*, 3, *b*. Shell, C. coronata, *Leach*, fig. 3, *c*.

The spines that usually ornament the whorls are tubular, and sometimes very long; the Clithons inhabit tropical countries; they crawl slowly, and only show, during locomotion, the tentacles and the tip of the muzzle; they prefer a stony bottom, clear and free from weeds, where the water is tolerably quiet.

Species of Clithon.

aculeata, *Chem.*
angulosa, *Recluz.*
aspersa, *Recluz.*
australis, *Chem.*
avellana, *Recluz.*
Bengalensis, *Chem.*
bicolor, *Recluz.*
Bourgainvillei, *Recluz.*
brevispina, *Lam.*
cælata, *Recluz.*
chlorostoma, *Brod.*
cincta, *Recluz.*
circumvoluta, *Recluz.*
corona, *Linn.*
coronata, *Leach.*
coronoides, *Less.*
Da Costæ, *Recluz.*
diadema, *Recluz.*
Dominigensis, *Linn.*
Donovani, *Recluz.*
Dringii, *Recluz.*
faba, *Sow.*
flavovirens, *Phil.*
fuliginosa, *Phil.*
guttata, *Recluz.*
inconspicua, *Phil.*
interrupta, *Recluz.*
Keraudrenii, *Le Guillou.*
Leachii, *Recluz.*
Lessonii, *Recluz.*
luctuosa, *Recluz.*
Menkeana, *Recluz.*
Michaudiana, *Recluz.*
obscurata, *Recluz.*
olivacea, *Recluz.*
parvula, *Le Guillou.*
pulchella, *Recluz.*
rarispina, *Mouss.*
Recluziana, *Le Guillou.*
rugata, *Recluz.*
ruginosa, *Recluz.*
sandalina, *Recluz.*
Sardoa, *Mke.*
solium, *Recluz.*
Souleyetiana, *Recluz.*
Sowerbyana, *Recluz.*
spinifera, *Recluz.*
spinosa, *Budgin.*

squarrosa, *Recluz.*
subgranosa, *Sow.*
subpunctata, *Recluz.*
triserialis, *Sow.*
Tritoniensis, *Le Guillou.*
Troschelii, *Recluz.*
unidentata, *Recluz.*

Genus CATILLUS, Humphrey.

Head large; foot attached on each side to the visceral mass, forming a cavity open behind.

Operculum small, thin, rudimentary, calcareous, quadrilateral, surface radiated, with a subulate tooth at the hinder edge, the other edges sharp and thin.

Shell ovate, depressed, patelloid, covered with an epidermis; apex nonspiral, nearly symmetrical, reflexed posteriorly; aperture very large; inner lip septiform, margin simple, sharp, edentulate.

Syn. Cimber, *Montf.* Navicella, *Lam.* Cibota, *Brown.*

Ex. C. lineatus, *Lamarck*, pl. 42, fig. 4. Operculum, C. porcellanus, *Linnæus*, fig. 4, *a*, 4, *b*. Shell, C. porcellanus, fig. 4, *c*.

The operculum in this genus is applied to the dorsal surface of the foot, and is concealed in the cavity which it forms with the visceral mass. In *Catillus* proper the apex is entirely posterior, often eroded, and distinct from the hind margin. The species are usually found on the banks of rivers adhering to floating sticks and to the petioles and roots of the Nipah palms and other plants that live near rivers; they are also found attached to smooth stones. Their principal localities are the Philippines, New Holland, New Guinea, the Feejees, New Ireland, and the Mauritius and adjacent

islands; they are not found in Europe and the Western Hemisphere.

Species of Catillus.

apiatus, *Le Guillou.*
Borbonicus, *Bory.*
Bourgainvillei, *Recluz.*
Cumingianus, *Recluz.*
depressus, *Less.*
Freycineti, *Recluz.*
Janellei, *Recluz.*
Luzonicus, *Souleyet.*
macrocephalus, *Le Guillou.*
parvus, *Mouss.*
porcellanus, *Linn.*
Sufreni, *Recluz.*
variabilis, *Recluz.*

Sub-gen. SEPTARIA, Férussac.

Apex sub-marginal, entire.

aponogetonis, *Vahl.*
Cookii, *Recluz.*
Entrecastreauxi, *Recluz.*
lineatus, *Lam.*

Sub-gen. ELARA, H. and A. Adams.

Apex a little in front of the hind margin, entire, laterally recurved.

ambiguus, *Recluz.*
cærulescens, *Recluz.*
clypeolum, *Recluz.*
compressus, *Bens.*
Durvillei, *Recluz.*
Laperousei, *Recluz.*
maculiferus, *Mouss.*
suborbicularis, *Sow.*

Fam. TROCHIDÆ.

Tongue elongate, median teeth broad, laterals five, denticulated, uncini very numerous, slender, with hooked points. Head proboscidiform; tentacles subulate, some-

times ciliated; eyes on free peduncles at their outer bases; two more or less developed head-lobes between the tentacles. Gill single, long, and linear. Sides of the foot with a large neck-lappet near the eye-peduncle, continuous with a conspicuous side-membrane bearing on its free margin from three to five tapering filaments; operculigerous lobe often ornamented with cirrhi.

Operculum horny, spiral, often with a solid, convex, calcareous coat, rarely wanting.

Shell pyramidal, turbinate, or ear-shaped; aperture pearly within.

The Trochoid Scutibranchs embrace an extensive series of herbivorous, littoral Mollusks, characterised by the fringed lobes and tentacular cirrhi of the head and sides, their pedunculated eyes, and by the pearly nature of their shells, which exhibit a brilliant nacre when the epidermis and outer coat are removed. They are invariably marine, feeding on the sea-weeds which abound along the shore and are distributed universally in all parts of the globe, being most numerous, and of larger growth and more beautiful colours in tropical seas. The shells of the *Trochidæ*, though formed on one type, assume great variety of contour and sculpture, being turbinate and provided with stony opercula in the *Eutropiinæ* and *Turbininæ;* cancellated and discoidal, with corneo-calcareous opercula in the *Liotiinæ;* conical or pyramidal, with horny, multispiral opercula in the *Trochinæ;* and ear-shaped, with the opercula rudimentary or wanting in the *Stomatelliņæ*, which section gradually leads to the family of *Haliotidæ*, in which the branchial plumes are symmetrical, the muscle of attachment is central, and the mantle is fissured in front.

Sub-fam. EUTROPIINÆ.

Operculum ovate, with a thick, solid, smooth, calcareous coat.

Shell ovately-oblong, porcellanous, polished, the last whorl rounded and produced at the base; aperture ovate.

Genus EUTROPIA, Humphrey.

Operculum stony, thick, ovate, smooth.

Shell ovately-oblong; spire elevated, whorls smooth, polished; aperture oval; columella smooth, flattened; outer lip thin, simple, acute.

Syn. Phasianus, *Montf.* Phasianella, *Lam.* Orthopnœa, *Gistel.*

Ex. E. Tritonis, *Chemnitz*, pl. 42, fig. 5. Operculum, E. Tritonis, fig. 5, *a*, 5, *b*. Shell, E. Tritonis, fig. 5, *c*.

When the animals of this genus crawl, the foot appears to be divided longitudinally into halves which advance alternately; when the right side moves, the left remains stationary, and when this in turn is carried forward, the other half serves as a point of support. MM. Audouin and Milne Edwards have observed that *E. pullus* exhibits the same mode of progression, which they compare to the amble or canter of a horse. In *Eutropia* proper the tentacles are ciliated, the head-lobes fringed, and the sides of the foot furnished with three cirrhi. In the smaller species, forming the *Tricolia* of Risso, the head-lobes appear to be wanting.

The larger species, all of which have beautifully variegated shells, are principally from Australia and the Islands in the Pacific, and the smaller species are from the West Indies and the Mediterranean.

Species of Eutropia.

Æthiopica, *Pfeiff.*
grata, *Phil.*
lineolata, *Wood.*
perdix, *Gray.*
rubens, *Lam.*
solida, *Born.*
Tritonis, *Chem.*
turgida, *Phil.*
variegata, *Lam.*

Sub-gen. TRICOLIA, Risso.

Head-lobes not developed; shell small, polished.

amœnula, *Phil.*
articulata, *Anton.*
bicarinata, *Dkr.*
brevis, *C. B. Adams.*
Capensis, *Dkr.*
concinna, *C. B. Adams.*
concolor, *C. B. Adams.*
coturnix, *Koch.*
elongata, *Krauss.*
flammulata, *Phil.*
flava, *Anton.*
fulgens, *Koch.*
guttata, *Phil.*
inconspicua, *Phil.*
intermedia, *Scacchi.*
Kochi, *Phil.*
marmorata, *Dufr.*
meleagris, *Beck.*
perforata, *Phil.*
pulchella, *Recluz.*
pulchra, *Gray.*
pullus, *Linn.*
pygmæa, *Phil.*
speciosa, *Mühlf.*
splendida, *Phil.*
strigata, *Phil.*
tenuis, *Mich.*
tessellata, *Beck.*
umbilicata, *D'Orb.*
unifascialis, *Kien.*
ventricosa, *Quoy and Gaim.*

Sub-fam. TURBININÆ.

Operculum orbicular, horny, with a solid, convex, calcareous coat.

Shell turbinate, the last whorl rounded and ventricose; aperture sub-circular; inner lip smooth, simple.

Genus TURBO, Linnæus.

Operculum without spiral ridges, externally convex, smooth or granular.

Shell turbinate, light, rather thin, covered with an epidermis, axis imperforate; spire elevated, whorls nodose, or with hollow spines; aperture sub-circular, longer than wide; inner lip flattened, produced anteriorly; outer lip thin, simple.

Syn. Fornax, *Klein*, not *Laporte.* Olearia, *Klein.* Saccus, *Klein.* Lunaria, *Fabr.* Lunaris, *Link.* Cidaris, *Chem.*, not *Bolt.*

Ex. T. smaragdus, *Martyn*, pl. 43, fig. 1. Operculum, T. smaragdus, fig. 1, *a*, 1, *b*. Shell, T. marmoratus, *Linnæus*, fig. 1, *c*.

The species of *Turbo* are principally inhabitants of the Islands of the Eastern Archipelago, Australia, and New Zealand.

Species of Turbo.

cornutus, *Chem.*
imperialis, *Gmel.*
Jourdeni, *Kien.*
magnificus, *Jonas.*
marmoratus, *Linn.*
militaris, *Reeve.*
petholatus, *Linn.*
smaragdus, *Martyn.*
variabilis, *Reeve.*

Genus SENECTUS, Humphrey.

Operculum without spiral ridges, externally convex and granular.

Shell turbinate, solid, axis usually perforate; spire elevated, whorls with transverse, granular, scaly, or spinose ribs; aperture ovate, longer than wide, produced anteriorly; columella narrow, rounded, circumscribed by the umbilicus, the fore part produced into a broad, channelled lobe.

Syn. Lunatica, *Bolt.* Batillus, *Schum.*

Ex. S. spinosus, *Chemnitz*, pl. 43, fig. 2. Operculum, S. argyrostoma, *Linnæus*, fig. 2, *a*, 2, *b*. Shell, S. chrysostoma, *Linnæus*, fig. 2, *c*.

The "Snake Shells," as these species of *Turbo* are called, may be readily distinguished by their variegated colours, ribbed whorls, and the peculiar character of the inner lip.

Species of Senectus.

argyrostoma, *Linn.*
articulatus, *Reeve.*
Chemnitzianus, *Reeve.*
chrysostoma, *Linn.*
circularis, *Reeve.*
crassus, *Gray.*
crenulatus, *Chem.*
gemmatus, *Reeve.*
histrio, *Reeve.*
Japonicus, *Reeve.*
Lajonkairii, *Desh.*
laminiferus, *Reeve.*
margaritaceus, *Linn.*
nivosus, *Reeve.*
Novæ Zealandiæ, *Chem.*
pulcher, *Reeve.*
pustulatus, *Reeve.*
radiatus, *Gmel.*
setosus, *Gmel.*
sparverius, *Gmel.*
speciosus, *Reeve.*
Spenglerianus, *Chem.*
spinosus, *Chem.*
squamiger, *Reeve.*
Ticaonicus, *Reeve.*
trochoides, *Reeve.*
tumidulus, *Reeve.*
turcicus, *Reeve.*

Genus SARMATICUS, Gray.

Operculum without spiral ridges, covered externally with numerous, separate, flat-topped tubercles.

Shell turbinate, nodulous, axis imperforate; spire depressed; aperture expanded, wider than long; inner lip flattened, excavated, with an elevated, curved line; outer lip with an intra-marginal line of black animal matter.

Syn. Cidaris, *Swains.*, not *Klein* or *Bolt.*

Ex. S. classicarius, *Gray*, pl. 43, fig. 3. Operculum, S. classicarius, fig. 3, *a*, 3, *b*.

Sarmaticus is peculiar from having a layer of blackish animal matter between the outer opaque, and the inner pearly, coat of the shell, which forms a dark zone between the edges of the two coats, just within the aperture. The name of Swainson (*Cidaris*) is already in use for a genus of *Echinodermata.*

Species of Sarmaticus.

classicarius, *Gray.*
helicinus, *Born.*
Natalensis, *Krauss.*

Genus LUNELLA, Bolten.

Operculum with an indistinct, sub-central rib, surrounded by a broad, flat margin.

Shell turbinate, solid, axis deeply and widely perforated; spire depressed, whorls flat, smooth; aperture circular; inner lip flattened and produced anteriorly.

Syn. Marmorostoma, *Swains.*

Ex. L. undulata, *Chemnitz*, pl. 43, fig. 4. Operculum, L. complanata, *Chemnitz*, fig. 4, *a*, 4, *b*. Shell, L. complanata, fig. 4, *c*.

The shells of this group may be readily distinguished by their smooth whorls, depressed spire, deep umbilicus, and produced and flattened columella.

Species of Lunella.

complanata, *Chem.*
crenifera, *Kien.*
granulata, *Chem.*
lugubris, *Reeve.*
mespilus, *Chem.*
porcata, *Reeve.*
porphyrites, *Martyn.*
undulata, *Chem.*

Genus MODELIA, Gray.

Operculum with a convex, sub-central, granular rib, and a sharp-edged, sub-marginal keel.

Shell turbinate, thin, granular; spire rather elevated; aperture sub-circular, wider than long; inner lip excavated, with an extended, thin callus.

Ex. M. granosa, *Martyn*, pl. 43, fig. 5. Operculum, M. granosa, fig. 5, *a*, 5, *b*.

The *Turbo rubicundus* of Chemnitz is another species of this genus, which, besides the peculiarities of the operculum, is remarkably thin and granular on the surface, reminding one very much of *Ziziphinus* among the *Trochinæ*. The species are from the shores of New Zealand.

Species of Modelia.

granosa, *Martyn.*
rubicunda, *Chem.*

Genus PRISOGASTER, Mörch.

Operculum ovate, convex, granular, with an elevated, grooved rib extending from the nucleus to the hinder margin, nearly parallel to the straight or inner edge.

Shell solid, turbinate, axis imperforate; spire elevated, whorls transversely grooved; aperture ovate, longer than wide; columella with a parallel groove; outer lip margined with white, lirate internally.

Ex. P. niger, *Gray*, pl. 43, fig. 6. Operculum, P. niger, fig. 6, *a*, 6, *b*. Shell, P. niger, fig. 6, *c*.

The animal of this genus, figured by M. D'Orbigny, appears to be furnished with a single, elongated, posterior filament, numerous shorter, anterior, tentacular filaments on the lateral membrane of the foot, and two conspicuous cirrhi on the sides of the opercular lobe.

Genus CALLOPOMA, Gray.

Operculum with a broad central, and three or five submarginal, spiral ribs, outer ribs toothed.

Shell turbinate, thick, axis imperforate; spire elevated, whorls smooth, or with transverse nodulose or squamose ridges; aperture circular, expanded; inner lip broad, flattened, excavated, produced anteriorly, and furnished with a parallel, curved groove.

Ex. C. fluctuatum, *Gray*, pl. 43, fig. 7. Operculum, C. fluctuatum, fig. 7, *a*, 7, *b*.

This genus somewhat resembles *Lunella*, but the axis is imperforate the aperture is dilated, and the operculum

is characterised by an extreme beauty and complexity of structure.

Species of Callopoma.

fluctuatum, *Gray.*
saxosum, *Wood.*
tessellatum, *Kien.*

Genus NINELLA, Gray.

Operculum concave externally, with two marginal, raised, spiral ribs, and a thin edge.

Shell turbinate, depressed, rugose, axis widely umbilicated, umbilicus perspective; aperture circular; inner lip broad, excavated, with a pearly, spoon-shaped pit near the columella, and a deep, longitudinal groove externally.

Ex. N. staminea, *Martyn*, pl. 44, fig. 1. Operculum, N. staminea, fig. 1, *a*, 1, *b*. Shell, N. staminea, fig. 1, *c*.

There are two species at present known of this curious genus, which seems to be intermediate between *Astralium* and *Turbo;* the form of the aperture and operculum, however, would refer it to this division.

Species of Ninella.

lamellosa, *Brod.*
staminea, *Mart.*

Genus COLLONIA, Gray.

Operculum circular, with many gradually-enlarging whorls, a convex external rib, and a central pit.

Shell small, solid, turbinate, smooth, transversely striated, axis imperforate; aperture circular, contracted at

the peritreme; inner lip moderate, with a thickened callosity.

Ex. C. marginata, *Nuttall*, pl. 44, fig. 2. Operculum, C. marginata, fig. 2, *a*, 2, *b*.

This genus comprehends several species of small turbo-like shells, mostly African; the fossil species of the Paris Eocine are larger and tolerably numerous; the genus is peculiar in the operculum and in the contraction of the aperture at the peritreme.

Species of Collonia.

brevis, *D'Orb.* (Phasianella).
cingulata, *Phil.* (Delphinula).
corallina, *Reeve.*
granulata, *Dkr.* (Delphinula).
marginata, *Nutt.*
murrea, *Reeve.*
neritina, *Dkr.*
phasianella; *C. B. Adams.*
pyropus, *Reeve.*
rubrocincta, *Migh.*
sanguinea, *Linn.*
verruca, *Gould.*
violacea, *Gould.*

Sub-fam. ASTRALIINÆ.

Operculum oblong or ovate, with an external, solid, calcareous coat.

Shell solid, trochiform, flat or concave at the base, whorls rugose or spinose, the last often stellate or keeled; aperture usually sub-quadrate.

Genus ASTRALIUM, Link.

Operculum ovate, flat, rather thinner at the edge, with a sub-central tubercle over the axis, and a broad, sub-marginal, spiral rib.

Shell trochiform, depressed; whorls convex, rugose, lamellated, the last often angulated and with hollow spinose scales round the periphery; axis perforated, sometimes covered by a callous deposit; aperture sub-quadrate, arcuated, sub-truncate anteriorly.

Syn. Imperator, *Montf.* Hercoles, *Montf.* Canthorbis, *Swains.* Tubicanthus, *Swains.*

Ex. A. heliotropium, *Martyn*, pl. 44, fig. 3. Operculum, A. calcar, *Linnæus*, fig. 3, *a*, 3, *b*. Shell, A. solare, *Chemnitz*, fig. 3, *c*.

Species of Astralium.

aster, *Phil.*
calcar, *Linn.*
cicatrosum, *Jonas.*
costulatum, *Lam.*
heliacum, *Phil.*
heliotropium, *Martyn.*
Phœbia, *Bolt.*
planum, *Gmel.*
solare, *Chem.*

Genus STELLA, Klein.

Operculum thick, with a slight convexity over the axis, outer edge thin, axis perforated.

Shell trochiform; spire elevated, whorls with radiating, spiny scales, axis imperforate; aperture sub-circular; columella rather flattened, incrassated, continuous anteriorly with the outer lip.

Syn. Cyclocantha, *Swains.* Calcar, *Montf.* Sol, *Klein.* Stellaria, *Schmidt.*

Ex. S. Spengleriana, *Chemnitz*, pl. 44, fig. 4. Operculum, S. stellata, *Chemnitz*, fig. 4, *a*, 4, *b*. Shell, S. Spengleriana, fig. 4, *c*.

The shells of this group are solid, spinose, and trochiform, with the axis imperforate. The species are chiefly

Australian in their geographical range, a few, however, also occurring in New Zealand.

Species of Stella.

armata, *Phil.*
asperata, *Lam.*
asteriscus, *Reeve.*
auripigmentum, *Jonas.*
bicrenata, *Gould.*
columellaris, *Phil.*
confragosa, *Gould.*
Cubana, *Phil.*
nobilis, *Gray.*
laciniata, *Gould.*
papillata, *Pot. and Mich.*
rotularis, *Lam.*
Spengleriana, *Chem.*
stellaris, *Gmel.*
stellata, *Chem.*
tuberosa, *Phil.*

Genus GUILFORDIA, Gray.

Operculum flat, with a very slight ridge near the arched, or outer margin.

Shell trochiform, depressed; whorls with an iridescent, golden nacre, and with transverse rows of granules, the last whorl angulated, the periphery surrounded by long, tubular, radiating spines; aperture trapeziform; inner lip sharp, incurved; outer lip thin, irregular; axis impressed, not perforate, umbilical region surrounded by a smooth, elevated callus.

Syn. Astralium, *Phil.*, not *Link.*

Ex. G. triumphans, *Philippi*, pl: 44, fig. 5. Operculum, G. triumphans, fig. 5, *a*, 5, *b*.

The shell in this genus has the same texture and golden nacreous appearance that are to be found in some of the species of *Ziziphinus*. The animal has not been observed, and the only species at present known is a beautiful shell from the shores of Japan.

Genus UVANILLA, Gray.

Operculum flat, with two distinct, convex, radiating ribs, the lower straight and nearly parallel to the edge, the upper arched, sub-central, the axis imperforate and callous.

Shell trochiform, acuminate, whorls flattened, fimbriated, axis imperforate, base excavated; aperture sub-quadrangular; inner lip acute, arcuated, sub-truncate in front.

Ex. U. fimbriata, *Lamarck*, pl. 44, fig. 6. Operculum, U. olivacea, *Wood*, fig. 6, *a*, 6, *b*. Shell, U. olivacea, fig. 6, *c*.

Several species of this genus are known, the shells being remarkable for their trochiform appearance and the sharp keels or fimbriated edges of the whorls.

Species of Uvanilla.

acuta, *Lam.*
brevispina, *Lam.*
Buschii, *Phil.*
erythrophthalmus, *Phil.*
fimbriata, *Lam.*,
gibberosa, *Chem.*
hexagona, *Phil.*
latispina, *Phil.*
occidentalis, *Chem.*
olivacea, *Wood.*
orichalcea, *Koch.*
tentoriiformis, *Jonas.*
tentorium, *Anton.*
unguis, *Wood.*

Genus PACHYPOMA, Gray.

Operculum oblong, sub-quadrangular, very convex externally.

Shell trochiform, elevated, axis imperforate, whorls with spinulose scales; aperture sub-circular; inner lip with a prominent, exterior, curved callus, anteriorly sub-truncate.

Ex. P. cælatum, *Chemnitz*, pl. 44, fig. 7. Operculum, P. cælatum, fig. 7, *a*, 7, *b*.

In *Pachypoma* the last whorl is not acutely angulated, and the aperture is somewhat circular; the prominent callus of the inner lip is peculiar, and the operculum is very thick and shelly.

Species of Pachypoma.

Americanum, *Gmel.*
cælatum, *Chem.*
imbricatum, *Gmel.*
inæquale, *Martyn.*
inerme, *Gmel.*
plicato-nodosum, *Chem.*
purpuratum, *Gmel.*
rhodostoma, *Phil.*
sculptum, *Phil.*
Sirius, *Gould.*

Genus LITHOPOMA, Gray.

Operculum ovate, thick, thicker at the end, with a broad, thin margin at the outer edge.

Shell turbinate; spire elevated, whorls nodulous, axis imperforate; aperture sub-circular; inner lip incurved, longitudinally grooved, anteriorly sub-truncate.

Ex. L. tuber, *Linnæus*, pl. 45, fig. 1. Operculum, L. tuber, fig. 1, *a*, 1, *b*.

The absence of umbilicus and the nodulous nature of the whorls, which are not acutely edged around the periphery, will serve to distinguish this genus; the shells have more colour on the outer surface than in the other members of this sub-family.

Species of Lithopoma.

Olfersii, *Trosch.*
saxosum, *Phil.*
tuber, *Linn.*
tuberosum, *Phil.*

Genus POMAULAX, Gray.

Operculum flat, with three convex, radiating ribs, the upper sub-marginal; axis perforated.

Shell trochiform; whorls nodulous, fimbriated at the sutures; axis imperforate, impressed, umbilical region with a curved, elevated callus ending in a sharp point at the columella; columella rounded, arched, anteriorly sub-truncate.

Ex. P. undosus, *Wood*, pl. 45, fig. 2. Operculum, P. undosus, 2, *a*, 2, *b*.

In this genus, which, on account of its trochus-like form, has often been placed with the *Trochinæ*, there is a peculiar circular callus round the columella ending in a point, as in the genera *Chlorostoma* and *Oxystele*.

Species of Pomaulax.

Japonicus, *Dkr.* undosus, *Wood.*

Genus COOKIA, Lesson.

Operculum ovate, smooth, flat, with a broad, spiral, sub-marginal rib.

Shell depressly turbinate; whorls rugose, scaly, the last with short, scaly spines at the periphery; axis imperforate, the umbilical region concavely depressed and surrounded by a spiral callus terminating in a point at the end of the columella.

Syn. Tubicanthus, *Swains.*

Ex. C. sulcata, *Martyn*, pl. 45, fig. 3. Operculum C. sulcata, fig. 3, *a*, 3, *b*. Shell, C. sulcata, fig. 3, *c*.

This genus appears to be intermediate between *Astralium* and *Bolma*, but does not quite accord with either. M. Lesson founded it upon the *Turbo Cookii* of Gmelin, so named after the great circumnavigator, but the specific name of Martyn has priority; the species comes from New Zealand.

Genus BOLMA, Risso.

Operculum ovate, sub-orbicular, convex, with a sub-central tubercle over the axis, and a broad, sub-marginal, spiral rib.

Shell turbinately trochiform, elevated, rugose, axis imperforate; aperture circular; inner lip wide, flattened, excavated, covered with a thickened callus.

Ex. B. rugosa, *Linnæus*, pl. 45, fig. 4. Operculum, B. rugosa, fig. 4, *a*, 4, *b*. Shell, B. rugosa, fig. 4, *c*.

In this form the periphery of the whorls is rounded, and the aperture is circular; the inner lip being covered with a thick callosity is another peculiarity.

Species of Bolma.

aurea, *Jonas.*
gibberosa, *Gmel.*
modesta, *Reeve.*
obtusa, *Chem.*
rugosa, *Linn.*

Sub-fam. LIOTIINÆ.

Operculum horny, with an external calcareous coat formed of separate, pearl-like, shelly particles placed in spiral lines.

Shell more or less discoidal, white, transversely sulcate or cancellated; aperture orbicular, scarcely pearly within.

Genus LIOTIA, Gray.

Shell turbinate, globose, or discoidal; whorls longitudinally ribbed or cancellated; axis perforated, umbilicus usually wide and deep; aperture circular, pearly within, peristome thickened, with a regular, marginal callus.

Ex. L. Peronii, *Kiener*, pl. 45, fig. 5. Operculum, L. Peronii, fig. 5, *a*, 5, *b*. Shell, L. scalarioides. *Reeve*. fig. 5, *c*.

The species of this genus are never spiny or laciniated, like those of *Angaria*, with which they have been confounded, and there is an expanded border round the aperture. Many fossil species occur in the Eocene formation of Britain and France; the recent species inhabit the Cape, the Philippines, and Australia.

Species of Liotia.

adamantina, *Duclos.*
affinis, *A. Adams.*
australis, *Kien.*
cancellata, *Gray.*
cidaris, *Reeve.*
clathrata, *Reeve.*
crenata, *Kien.*
depressa, *Reeve.*
discoidea, *Reeve.*
Kieneri, *Phil.*
nodulosa, *A. Adams.*
Peronii, *Kien.*
pulcherrima, *A. Adams.*
scalarioides, *Reeve.*
siderea, *Reeve.*
tuberculosa, *D'Orb.*
varicosa, *Reeve.*

Sub-gen. ARENE, H. and A. Adams.

Shell radiately painted with red; whorls muricated, the last

stellate at the periphery, or angulated and keeled; peritreme more or less varicose.

cruentata, *Mühlf.*
muricata, *Humph.*
Tamsiana, *Dkr.*

Sub-gen. ILAIRA, H. and A. Adams.

Shell discoidal; spire depressed, whorls angulated, detached, the last entirely free; aperture quadrate, peristome sub-acute.

evoluta, *Reeve.*

Genus CYCLOSTREMA, Marryatt.

Eye-peduncles very short, tentacles ciliated; foot with long, curved, linear auricles in front, the sides with three ciliated filaments.

Shell orbicular, depressed, widely umbilicated; spire very short, whorls rounded, smooth, cancellated, transversely striated, or grooved; aperture orbicular, not pearly within, peristome continuous, acute.

Syn. Delphinoidea, *Brown.*

Ex. C. serpuloides, *Montagu*, pl. 45, fig. 6. Shell, C. cancellata, *Marryatt*, fig. 6, *a*.

The interior of the aperture in these shells is not pearly as in *Liotia*. The animal of *Skenea divisa*, Fleming, which is the same as *Cyclostrema serpuloides*, has been described by Mr. Clark, as well as that of *C. elegantula* or *Cutleriana*, and the existence of neck-lappets and of filaments on each side of the foot show the position of the genus to be among the *Trochidæ*. Should the smaller British species require to be separated from

the more typical forms they will take the name of *Delphiñoidea*, Brown.

Species of Cyclostrema.

angulata, *A. Adams.*
cancellata, *Marryatt.*
cingulifera, *A. Adams.*
costulata, *Müll.*
elegantula, *Phil.*
exigua, *Phil.*
exilis, *Phil.*
lævis, *Phil.*
micans, *A. Adams.*
nitens, *Phil.*
nitida, *A. Adams.*
nitidissima, *Adams.*
nivea, *Chem.*
paulla, *Phil.*
Reeveana, *Hinds.*
rota, *Forbes and Hanley.*
serpuloides, *Mont.*
sulcata, *A. Adams.*

Sub-gen. CYNISCA, H. and A. Adams.

Shell depressly turbinate; umbilicus wide and deep, perspective, surrounded by a spiral callus; whorls with transverse, granular ribs; aperture circular; inner lip straight; outer lip thickened, lirate within, continued posteriorly on the penultimate whorl beyond the inner lip.

granulata, *A. Adams.*

Sub-gen. SERPULARIA, Römer (? Spira, *Brown*).

Shell orbicular, discoidal, evolute; spire depressly concave, whorls rounded, disunited; aperture circular, peritreme continuous.

spirula, *A. Adams.*

Genus ADEORBIS, Searles Wood.

Shell depressly conical, orbicular, deeply umbilicated; whorls few, not nacreous, flattened, smooth or striated, the last more or less angulated at the periphery; aperture transversely oval, peristome interrupted; inner lip sinuated; outer lip arcuate, simple, acute.

Ex. A. subcarinata, *Montagu*, pl. 45, fig. 7.

The principal difference between this genus and *Cyclostrema* consists in the more or less trochiform appearance of the shell, and in the peritreme not being circular and continuous. A few species were described by one of the authors under the generic name of *Cyclostrema*.

Species of Adeorbis.

elegans, *A. Adams.*
plana, *A. Adams.*
planorbula, *A. Adams.*
porcata, *Phil.*
scabra, *Phil.*
subcarinata, *Mont.*

Sub-fam. UMBONIINÆ.

Rostrum rudimentary; frontal lobes greatly developed.

Operculum horny, thin, of many gradually-enlarging whorls finely ciliated on the outer edge.

Shell orbicular, depressed, polished, porcellanous, the umbilical region often covered with a callous deposit.

Genus UMBONIUM, Link.

Shell orbicular, depressed, porcellanous; whorls smooth, polished, umbilical region covered with a large

prominent callosity; aperture small, transverse; inner lip ending in a simple point; outer lip acute.

Syn. Globulus, *Schum.*, not *J. Sow.* Helicina, *Gray*, not *Lam.* Rotella, *Lam.* Pitonnillus, *Montf.* Ptychomphalus, *Agass.*

Ex. U. vestiarium, *Linnæus*, pl. 46, fig. 1. Operculum, U. vestiarium, fig. 1, *a*, 1, *b*.

In the animal of *Umbonium*, which has been first correctly described by Dr. Gray, the lateral fringe of the foot is distinct, with three tentacular filaments on each side; at the front of the right side, near the base of the tentacles, it is produced into an oblong, fleshy lobe. The right tentacle is the larger and free, with an oblong, compressed lobe on its hinder side which has an indistinct indication of an eye; the left tentacle is smaller and partly attached to the upper side of the left eye-pedicel, which is cylindrical, bearing a very distinct eye, and furnished with a large, membranous expansion attached to the whole of its length on its left side, and which is fringed at the edge. This frontal appendage, when the animal is alive, is folded on itself to form a tube, which has caused it to be mistaken for a siphon.

Species of Umbonium.

anguliferum, *Phil.*
articulatum, *Phil.*
australe, *Phil.*
chalconotum, *A. Adams.*
conicum, *Adams and Reeve.*
depressum, *A. Adams.*
elegans, *Beck.*
giganteum, *Less.*
moniliferum, *Lam.*
parvulum, *Anton.*
sagittatum, *Hinds.*
suturale, *Lam.*
vestiarium, *Linn.*

Sub-gen. ETHALIA, H. and A. Adams.

Shell orbicular, turbinately depressed; whorls convex, smooth or transversely striated, the last rounded at the periphery; umbilicus partly closed by a callous deposit; columellar lip ending anteriorly in an obtuse, dilated callus.

Guamense, *Quoy and Gaim.* striolatum, *A. Adams.*

Genus ISANDA, H. and A. Adams.

Shell porcellanous, orbiculately conoidal, polished; aperture sub-quadrate; inner lip straight, forming an angle with the outer lip; umbilicus open, perspective, the margin crenulated.

Ex. I. coronata, *A. Adams*, pl. 46, fig. 2. Operculum, I. coronata, fig. 2, *a*, 2, *b*.

In this genus the umbilicus is open and not covered by a callous deposit as in *Umbonium*, and the margin is crenulated; the texture of the shell is solid and porcellanous, and not nacreous and thin as in *Margarita;* the species, at present known, are from Australia and the Philippine Islands.

Species of Isanda.

coronata, *A. Adams.* pulchella, *A. Adams.*
lepida, *A. Adams.* sulcifera, *A. Adams.*

Genus CAMITIA, Gray.

Shell orbicular, depressed, smooth, polished, axis imperforate; columella spirally twisted above, forming a

false umbilicus with the margin simple; columella with the edge edentulate and ending in a point.

Ex. C. pulcherrima, *Gray*, pl. 46, fig. 3.

Camitia somewhat resembles *Clanculus*, but its surface is entirely smooth like that of *Umbonium*. As in *Clanculus*, moreover, the aperture communicates with the cavity of the false umbilicus by means of an open, transverse fissure. There are but two species at present known.

Species of Camitia.

Grayi, *A. Adams.* pulcherrima, *Gray.*

Genus CHRYSOSTOMA, Swainson.

Shell turbinate, solid, smooth, umbilicated, umbilicus almost covered by a large callus; whorls few, convex; aperture effuse, round; inner lip with a large, spreading callus, covering, and nearly concealing, the umbilicus.

Ex. C. paradoxum, *Born*, pl. 46, fig. 4.

The animal of this genus is unknown; the shell somewhat resembles *Umbonium*, but the surface is not polished; the outer lip is marginate internally, and the interior of the aperture is coated with a beautiful, golden, nacreous deposit.

Sub-fam. TROCHINÆ.

Operculum horny, orbicular, composed of numerous, narrow whorls, with the nucleus central.

Shell conoidal or pyramidal, the last whorl more or less angulated at the circumference, and usually flattened

beneath; aperture more or less transverse, wider than long.

Genus ANGARIA, Bolten.

Shell turbinate, sub-discoidal, umbilicated, umbilicus wide, pervious; whorls rounded, scaly or spinose; aperture circular, entire, peritreme continuous, sub-reflexed, without a marginal varix.

Syn. Cyclostoma, *Lam.* (*olim*). Delphinula, *Roissy.* Delphinulus, *Montf.* Scalator, *Gist.*

Ex. A. atrata, *Chemnitz*, pl. 46, fig. 5. Operculum, A. Martinii, *A. Adams*, fig. 5, *a*, 5, *b*. Shell, A. delphinus, *Linnæus*, fig. 5, *c*.

We have adopted Bolten's appellation for this genus, in accordance with the law of priority, thereby preventing the necessity of using the name *Cyclostoma*, which, however, was afterwards discarded by Lamarck for that of *Delphinula*, suggested by Roissy.

Species of Angaria.

aculeata, *Reeve.*
atrata, *Chem.*
calcarella, *H. and A. Adams* (calcar, *A. Adams*).
coronata, *A. Adams.*
delphinus, *Linn.*
distorta, *Linn.*
euracantha, *A. Adams.*
formosa, *Reeve.*
incisa, *Reeve.*
Martinii, *A. Adams.*
melanacantha, *Reeve.*
nodulosa, *Gmel.*
sphærula, *Kien.*
stellaris, *Adams and Reeve.*
Tyria, *Reeve.*

Genus LIVONA, Gray.

Lateral membrane of the foot with numerous, compound appendages.

Shell conoidal, sub-globose, smooth, solid, umbilicated, umbilicus moderate, with a tooth-shaped process at the entrance; aperture circular, peritreme simple, thin, acute.

Syn. Turbo, *Adans.*, not *Linn.* Tigris, *Klein*, not *Linn.* Meleagris, *Montf.*, not *Linn.* Meleager, *Griff.* Cittarium, *Phil.* Trochus, *Swains.*, not *Linn.*

Ex. L. pica, *Linnæus*, pl. 46, fig. 6. Operculum, L. pica, fig. 6, *a*, 6, *b*. Shell, L. pica, fig. 6, *c*.

The appendages of the lateral membrane of the foot are compound in this genus, while in the other genera of *Trochidæ* they are, as far as we know, simple.

Genus TROCHUS, Linnæus.

Shell conical, axis imperforate, last whorl angulated at the periphery; columella superiorly spirally twisted, forming a canal, anteriorly simple, straight, ending in a point.

Ex. T. Niloticus, *Linnæus*, pl. 46, fig. 7. Operculum, T. Niloticus, fig. 7, *a*. Shell, T. Niloticus, fig. 7, *b*.

The genus *Trochus*, as strictly defined, comprises but few species, all inhabitants of equatorial countries. The axis of the shell is not truly perforated, but the columella being twisted abruptly on itself at the hind part, gives the appearance of a false umbilicus, and produces the kind of canal which serves to distinguish the genus.

Species of Trochus.

acutangulus, *Chem.*
asperulus, *Lam.*
Cumingii, *A. Adams.*
fastigiatus, *A. Adams.*
maximus, *Koch.*
Niloticus, *Linn.*
spinosus, *Chem.*

Genus CARDINALIA, Gray.

Shell conical, axis imperforate, last whorl angulated at the periphery; columella simple superiorly, without any transverse canal, and ending below in a simple point.

Ex. C. virgata, *Gmelin*, pl. 46, fig. 8.

In this genus the axis is imperforate, nor is there any appearance even of a false umbilicus, the columella not forming a spiral fold at the upper part as in many genera of the *Trochidæ;* there is consequently no posterior canal as in *Trochus;* the arcuate columella ends in a tooth-like point below, the whorls are flat and granular, and the last whorl is angulated at the circumference.

Genus TECTUS, Montfort.

Shell conical, axis imperforate; whorls numerous, smooth or tubercular, the last angulated at the circumference; aperture much wider than long; columella short, anteriorly spirally twisted, ending in a point.

Syn. Pyramis, *Schum.*, not *Bolt.* or *Brown.* Pyramidea, *Swains.*

Ex. T. fenestratus, *Gmelin*, pl. 47, fig. 1. Operculum, T. fenestratus, fig. 1, *a.* 1, *b.* Shell, T. pyramis, *Born*, fig. 1, *c.*

The genus *Tectus* has the appearance of being umbilicated, but, in reality, the axis is imperforate; the shells are at once recognised by the short, spiral twist formed by the *fore* part of the columella, and which serves to characterize the genus.

Species of Tectus.

architectonicus, *A. Adams.*
caperatus, *Phil.*
crenulatus, *Lam.*
dentatus, *Forsk.*
fenestratus, *Gmel.*
ferruginosus, *Phil.*
Forskälii, *Bolt.*
leucogaster, *A. Adams.*
Mauritianus, *Gmel.*
pyramis, *Born.*
prasinus, *Mke.*
triserialis, *Lam.*

Genus POLYDONTA, Schumacher.

Shell conoidal, axis imperforate; whorls almost always granulated, the last angulated; aperture nearly rhomboidal; columella spirally twisted, forming a funnel-shaped, false umbilicus, the margin furnished anteriorly with many teeth.

Syn. Lamprostoma, *Swains.*, not *Rafin.*

Ex. P. Sandwichensis, *Eydoux*, pl. 47, fig. 2. Operculum, P. lineata, *Lamarck*, fig. 2, *a.* Shell, P. lineata, fig. 2, *b.*

The front, sharp, free edge of the columella in *Polydonta* is armed with numerous teeth, and does not end in a simple point, as in *Tectus;* the genus is distinguished from *Clanculus* by the conoidal shape and simple outer lip of the shell.

Species of Polydonta.

aspera, *Chem.*
callicoccus, *Phil.*
concinna, *Phil.*
conspersa, *Gmel.*

corrugata, *A. Adams.*
costata, *Gmel.*
elegantula, *Wood.*
eucosomus, *Phil.*
eustephes, *Phil.*
flammulata, *Lam.*
gibberosa, *Chem.*
gibberula, *A. Adams.*
granularis, *Bolt.*
Hanleyana, *Reeve.*
ignobilis, *Phil.*
incarnata, *Phil.*
incrassata, *Lam.*
lineata, *Lam.*
maculata, *Linn.*
ochroleucos, *Gmel.*
pallidula, *A. Adams.*
pustulosa, *Phil.*
reticulata, *Wood.*
rubricata, *Phil.*
rugulosa, *Koch.*
Spengleri, *Chem.*
Sandwichensis, *Eyd.*
squammigera, *A. Adams.*
squarrosa, *Lam.*
tentorium, *Gmel.*
tiarata, *Quoy and Gaim.*
turboides, *Bolt.*
turris, *Phil.*
vernalis, *Chem.*
verrucosa, *Gmel.*
viridis, *Chem.*

Sub-gen. INFUNDIBULUM, Montfort (Carinidea, *Swains.*).

Shell depressly conical; whorls simple, flattened, the last concave at the base, with the periphery acutely angulated; columella edentulate, or with obsolete teeth.

Californica, *A. Adams.*
carinifera, *Beck.*
chloromphalus, *A. Adams.*
concava, *Linn.*
delicatula, *Phil.*
depressa, *Gmel.*
eugramma, *Phil.*
Kochii, *Phil.*
radiata, *Gmel.*
Saga, *Phil.*

Genus CLANCULUS, Montfort.

Shell conoidal or turbinate, axis imperforate, whorls almost always granulated, the last rounded at the periphery; aperture usually narrowed or ringent; columella spirally twisted above, forming a false umbilicus with a crenate margin, edge of columella with numerous, strong,

tooth-like plaits; outer lip often strongly dentate internally.

Syn. Clangulus, *Blainv.* Fragella, *Swains.* Otavia, *Risso*, not *Gray.*

Ex. C. Patagonicus, *D'Orbigny*, pl. 47, fig. 3. Shell, C. Pharaonis, *Linnæus*, fig. 3, *a*.

In this genus the shell is turbinate, the last whorl is rounded, and both lips of the aperture are furnished with numerous tubercular teeth.

Species of Clanculus.

acuminatus, *A. Adams.*
agrestis, *Chem.*
albinus, *A. Adams.*
amænus, *Koch.*
anus, *Phil.*
atropurpureus, *Gould.*
Bertheloti, *D'Orb.*
brunneus, *A. Adams.*
carinatus, *A. Adams.*
cerasinus, *Phil.*
cingulifer, *A. Adams.*
clanguloides, *Wood.*
clangulus, *Wood.*
conspersus, *A. Adams.*
corallinus, *Gmel.*
edentulus, *A. Adams.*
elegans, *Koch.*
erubescens, *Phil.*
flagellatus, *Phil.*
gibbosus, *A. Adams.*
glomus, *Phil.*
Guinëensis, *Gmel.*
Jussieui, *Payr.*
Kraussii, *Phil.*
Largillierti, *Phil.*
limbatus, *Quoy and Gaim.*
lupinus, *Mke.*
Ludwigi, *Krauss.*
maculosus, *A. Adams.*
margaritarius, *Phil.*
Maugeri, *Wood.*
Mediterraneus, *Wood.*
microdon, *A. Adams.*
miniatus, *Anton.*
minor, *A. Adams.*
morum, *Phil.*
multigranus, *Phil.*
nigricans, *A. Adams.*
nodiliratus, *A. Adams.*
nodulosus, *A. Adams.*
omalomphalus, *A. Adams.*
ormophorus, *A. Adams.*
Patagonicus, *D'Orb.*
personatus, *Phil.*
Pharaonis, *Linn.*
puniceus, *Phil.*
ringens, *Mke.*
rotellæformis, *Phil.*
scabrosus, *Phil.*
Smithii, *Wood.*

spadiceus, *Phil.*
stigmatarius, *A. Adams.*
sulcarius, *A. Adams.*
textillosus, *A. Adams.*
turbinoides, *A. Adams.*
turgidulus, *Brocc.*
unedo, *A. Adams.*
variegatus, *A. Adams.*
zebrides, *A. Adams.*

Genus CRASPEDOTUS, Philippi.

Shell nearly conoidal, axis imperforate, whorls cancellated, convex; columella twisted, forming a false umbilicus, and with a strong tooth narrowing the aperture; outer lip internally sulcate, externally with a conspicuous, marginal varix.

Syn. Olivia, *Cantraine*, not *Bertoloni.* Otavia, *Gray*, not *Risso.*

Ex. C. Otavianus, *Cantraine*, pl. 47, fig. 4.

The name used by Cantraine was employed previously by Bertoloni for a genus of Sponges. A single recent species of *Craspedotus* only is known, offering the striking peculiarity, in this family, of a variced outer lip.

Genus MONODONTA, Lamarck.

Shell conoidal, imperforate, whorls granular or transversely sulcate, the last rounded; aperture oval; columella with teeth and a concave pit; outer lip internally triple, the outer belt porcellanous, the middle perlaceous, the inner with an elevated, porcellanous border.

Syn. Labio, *Oken*, not *Gray.* Monodontes, *Montf.* Odontis, *Sow.* Trochidon, *Swains.* Monodon, *Schweigg.* Unidens, *Schinz.*

Ex. M. canalifera, *Lamarck*, pl. 47, fig. 5. Shell, M. labio, *Linnæus*, fig. 5, *a.*

There is usually a single, strong tooth at the fore part of the columella in this genus, and the operculum is orbicular and many-whorled.

Species of Monodonta.

australis, *Lam.*
canalifera, *Lam.*
circumcincta, *A. Adams.*
dama, *Phil.*
exigua, *A. Adams.*
labio, *Linn.*
neritoides, *Phil.*
parva, *Trosch.*
rugulosa, *A. Adams.*
spilota, *A. Adams.*
tuberculata, *A. Adams.*
turbinata, *Gmel.*
viridis, *Lam.*

Genus EUCHELUS, Philippi.

Operculum ovate, of few, rapidly-enlarging whorls.

Shell turbinately conoidal, whorls rounded, with transverse, granular ribs, axis usually perforated; columella acute, with a small tooth at the fore part; aperture circular; outer lip thick, obtuse, rounded, internally crenate.

Syn. Euchele, *Phil.* Aradasia, *Gray.*

Ex. E. denigratus, *Chemnitz*, pl. 47, fig. 6. Operculum, E. denigratus, fig. 6, *a*. Shell, E. denigratus, fig. 6, *b*.

The shells of this genus are usually umbilicated, and the whorls are always adorned with transverse, granular ribs; there is a single tooth on the columella, and the operculum is ovate, and of comparatively few whorls.

Species of Euchelus.

alveolatus, *A. Adams.*
asper, *Chem.*
baccatus, *Mke.*
circulatus, *Anton.*

clathratus, *A. Adams.*
denigratus, *Chem.*
Dunkeri, *Koch.*
edentulus, *A. Adams.*
exasperatus, *A. Adams.*
foveolatus, *A. Adams.*
gemmatus, *Gould.*
Guttadauri, *Phil.*
horridus, *Phil.*
incisus, *Mke.*
inconspicuus, *Phil.*
lacteus, *Phil.*
oxytropis, *Phil.*
Philippii, *Koch.*
Philippinus, *A. Adams.*
pullatus, *Phil.*
punctigerus, *A. Adams.*
ruber, *A. Adams.*
Strangei, *A. Adams.*
sulciferus, *A. Adams.*
triciugulatus, *A. Adams.*

Sub-gen. PERRINIA, H. and A. Adams.

Shell trochiform; whorls flattened, cancellated; aperture quadrangular; columella nearly straight, with several tubercles at the fore part; outer lip strongly lirate internally.

anguliferus, *A. Adams.*
lirostoma, *A. Adams.*

Genus DILOMA, Philippi.

Shell conoidal, smooth, imperforate, umbilical region covered with a thin, porcellanous expansion of the columella; columellar margin produced anteriorly, forming an elevated ridge round the inner margin of the outer lip.

Ex. D. nigerrima, *Chemnitz*, pl. 47, fig. 7. Operculum, D. nigerrima, fig. 7, *a*, 7, *b*. Shell, D. nigerrima, fig. 7, *c*.

This genus closely resembles *Oxystele*, the columellar margin, however, does not extend into the outer edge of the labrum, but forms an elevated border within and parallel to it.

Species of Diloma.

atrovirens, *Phil.*
carbonaria, *Phil.*
cingulata, *Quoy and Gaim.*
coracina, *Trosch.*
melanoloma, *Mke.*
morio, *Trosch.*
nigerrima, *Chem.*
odontis, *Wood.*
piperina, *Phil.*
radula, *Parreyss.*
scorpio, *Gray.*
sulcata, *Wood.*
undulosa, *A. Adams.*

Genus THALOTIA, Gray.

Shell solid, ovate, turreted, axis imperforate, whorls flat, granulated or transversely ribbed; aperture oval, longer than wide; columella anteriorly tubercular, subtruncate; outer lip thickened and crenulated internally.

Ex. T. conica, *Gray*, pl. 48, fig. 1. Operculum, T. pulcherrima, fig. 1, *a*, 1, *b*.

The shells of *Thalotia* are elevately conoidal, with sub-quadrangular apertures, the columella is rather straight, truncated and tubercular at the fore part, and the whorls are transversely grooved or furnished with granulated ribs. The species appear to be confined, in geographical range, to Australia and New Zealand.

Species of Thalotia.

balteata, *Phil.*
conica, *Gray.*
crenellifera, *A. Adams.*
elongata, *Wood.*
Lehmanni, *Mke.*
obscura, *Wood.*
picta, *Wood.*
pulcherrima, *Wood.*
Schayeri, *Trosch.*
strigata, *A. Adams.*
suturalis, *A. Adams.*
tricingulata, *A. Adams.*

Troschelii, *Phil.*
zebrides, *A. Adams.*
Zebuensis, *A. Adams.*

Genus ZIZIPHINUS, Leach.

Shell trochiform, often almost conical, axis imperforate, seldom umbilicated, umbilical region covered with a callosity, last whorl angular at the circumference; aperture quadrangular; columella simple, often ending in a pointed tooth.

Syn. Trochilus, *Humph.*, not *Linn.* Conulus, *Nardo*, not *Fitz.* or *Küst.* Calliostoma, *Swains.* Callistomus, *Herrm.*

Ex. Z. conuloides, *Lamarck*, pl. 48, fig. 2. Operculum, Z. conuloides, fig. 2, *a.* Shell, Z. conuloides, fig. 2, *b.*

The species of this genus are very numerous, often brilliant in colour and of exquisite sculpture. The shells are usually conical, with quadrate apertures, and with the inner lip ending, in front, in a simple tooth-like point.

Species of Ziziphinus.

agrestis, *Phil.*
alabastrum, *Beck.*
alternatus, *Phil.*
annulatus, *Martyn.*
Antonii, *Koch.*
armillatus, *Wood.*
asperulatus, *A. Adams.*
bicingulatus, *Lam.*
Californicus, *A. Adams.*
callichrous, *Phil.*
canaliculatus, *Martyn.*
Cecillii, *Phil.*
chlorostoma, *Mke.*
Chemnitzii, *Phil.*
ciliaris, *Mke.*
cingulatus, *Brocc.*
comptus, *A. Adams.*
conuloides, *Lam.*
conulus, *Linn.*
crenulatus, *Brocc.*
Cunninghami, *Gray.*
decoratus, *Phil.*

decussatus, *A. Adams.*
dubius, *Phil.*
duplicatus, *A. Adams.*
elegantulus, *A. Adams.*
erythræus, *Chem.*
euglyptus, *A. Adams.*
exasperatus, *Penn.*
eximius, *Reeve.*
filosus, *Wood.*
firmus, *Phil.*
flavus, *Anton.*
fragrum, *Phil.*
fulvus, *Phil.*
gemmosus, *Reeve.*
gilvus, *Phil.*
Gmelinii, *Phil.*
goniostoma, *Mke.*
granulatus, *Born.*
hyacinthinus, *Ren.*
impressus, *Anton.*
indistinctus, *Wood.*
interruptus, *Wood.*
incrassatus, *Phil.*
Japonicus, *A. Adams.*
Javanicus, *Lam.*
jujubinus, *Linn.*
lævigatus, *Phil.*
lepidus, *Koch.*
liratus, *A. Adams.*
lima, *Phil.*
luridus, *Nutt.*
maculatus, *Phil.*
metaformis, *Phil.*
millegranus, *Phil.*
Montagui, *Gray.*
nebulosus, *A. Adams.*
nitidulus, *Phil.*
nobilis, *Phil.*
nocturnus, *Phil.*
nubilus, *Phil.*
nudus, *Phil.*
ornatus, *Lam.*
parvulus, *Phil.*
perspectivus, *Koch.*
picturatus, *A. Adams.*
polychroma, *A. Adams.*
pulchellus, *Phil.*
pulcher, *C. B. Adams.*
pumilio, *Phil.*
punctulatus, *Martyn.*
puncturatus, *A. Adams.*
pyrgos, *Phil.*
quadrisulcatus, *Phil.*
rubropunctatus, *A. Adams.*
scitulus, *A. Adams.*
scobinatus, *A. Adams.*
selectus, *Chem.*
solidus, *Phil.*
speciosus, *A. Adams.*
spectabilis, *A. Adams.*
squarrosus, *Phil.*
striatus, *Linn.*
strigosus, *Gmel.*
Ticaonicus, *A. Adams.*
tigris, *Martyn.*
torquatus, *Anton.*
Tranquebaricus, *Chem.*
unicinctus, *A. Adams.*
unidentatus, *Phil.*
viridulus, *Mke.*

Genus TURCICA, H. and A. Adams.

Shell conoidal, thin, sub-diaphanous, imperforate; whorls with transverse rows of granules, the last rounded at the periphery; columella thick, spirally twisted posteriorly, ending anteriorly in an obtuse, prominent point; outer lip thin, simple, acute.

Ex. T. monilifera, *A. Adams*, pl. 48, fig. 3.

This genus is founded on a beautiful trochoid shell from Australia, having somewhat the aspect of *Ziziphinus*, with the whorls shining with a golden nacre and ornamented with transverse series of granules. The chief peculiarity of the genus consists in the spirally-contorted columella.

Genus CANTHARIDUS, Montfort.

Shell thin, ovately conoidal, axis imperforate, whorls striated or rugose; aperture sub-tetragonal, longer than wide, iridescent within; columella rather straight, simple, ending anteriorly in a simple point; outer lip thin.

Syn. Cantharis, *Férus.*, not *Bolt.* Cantharius, *Voight.*

Ex. C. iris, *Humphrey*, pl. 48, fig. 4.

The shells of *Cantharidus* are ovate and thin, the outer lip is acute, and the columella wants the conspicuous tooth seen in *Elenchus*; the whorls, moreover, are not polished, as in that genus, but are usually transversely striated.

Species of Cantharidus.

articularis, *A. Adams.*
artizona, *A. Adams.*
cingulifer, *A. Adams.*
iris, *Humph.*

moniliger, *A. Adams.*
nigricans, *A. Adams.*
nitidulus, *Phil.*
pallidulus, *A. Adams.*
porcatus, *Phil.*
purpuratus, *Martyn.*
rufozona, *A. Adams.*
tenebrosus, *A. Adams.*
Zealandicus, *A. Adams.*

Genus ELENCHUS, Humphrey.

Shell elevately conoidal, axis imperforate; spire elevated, acute, whorls flat, smooth, usually polished; aperture ovate, longer than wide; inner lip usually with a conspicuous tooth; outer lip internally thickened and grooved.

Ex. E. iriodon, *Quoy and Gaimard*, pl. 48, fig. 5: Shell, E. badius, *Wood*, fig. 5, *a*.

The shells in this genus are thick and polished, and there is usually a single tooth, more or less produced, at the fore part of the columella; the aperture is vividly iridescent within, and the surface is often ornamented with varied and beautiful markings. The species are Australian in their geographical distribution.

Species of Elenchus.

apicinus, *Mke.*
australis, *Quoy and Gaim.*
badius, *Wood.*
bellulus, *Dkr.*
elegans, *Gmel.*
gracilis, *Anton.*
iriodon, *Quoy and Gaim.*
lætus, *Phil.*
leucostigma, *Mke.*
lineatus, *Lam.*
minor, *Trosch.*
roseus, *Lam.*
rutilus, *A. Adams.*
splendidulus, *Swains.*
virgulatus, *Phil.*

Genus BANKIVIA, Beck.

Shell subulately conical, porcellanous; spire elevated, acute, whorls flat, smooth, without epidermis; aperture small, sub-quadrangular, not pearly within; columella twisted, truncate anteriorly; outer lip acute, simple.

Ex. B. varians, *Beck*, pl. 48, fig. 6.

The position of this genus among the *Trochidæ* is somewhat doubtful, as neither the animal nor operculum are known; the aperture not being pearly within, and the columella being truncate and tortuous, are against this view, while other characters of the shell seem to assimilate the genus to *Elenchus* and *Ziziphinus*.

Species of Bankivia.

major, *A. Adams.*
nitida, *A. Adams.*
varians, *Beck.*

Genus TROCHOCOCHLEA, Klein.

Shell solid, conoidal, imperforate in the adult; whorls smooth or transversely lirate, the last rounded at the periphery; aperture nearly rhomboidal; columella thick and rounded, ending anteriorly in a slightly-prominent tubercle.

Syn. Trochius, *Leach.* Gibbium, *Gray.* Osilinus, *Phil.* Labio, *Gray*, not *Oken.* Melagraphia, *Stentz.*

Ex. T. tæniata, *Quoy and Gaimard*, pl. 48, fig. 7. Operculum, T. constricta, *Macleay*, fig. 7, *a.* Shell, T. constricta, fig. 7, *b.*

In this genus the axis is imperforate, the inner lip is broad and excavated, and the columella, instead of ending in a prominent tooth as in *Monodonta*, has only a blunt tubercle at the fore part.

Species of Trochocochlea.

angulata, *Quoy and Gaim.*
capillacea, *Phil.*
concolor, *A. Adams.*
constricta, *Macleay.*
corrosa, *A. Adams.*
fuliginea, *A. Adams.*
gallina, *Forbes.*
lineata, *Da Costa.*
melaleuca, *Link.*
mutabilis, *Phil.*
neritoides, *Born.*
porcata, *A. Adams.*
rudis, *A. Adams.*
sanguinea, *Gray.*
subrostrata, *Gray.*
tæniata, *Quoy and Gaim.*
turbinata, *Born.*
turbiniformis, *Salis.*
zebra, *Wood.*
zebrina, *Phil.*

Sub-gen. TEGULA, Lesson.

Whorls with transverse, granular ribs; columella spirally contorted, ending anteriorly in a large, obtuse, prominent tubercle.

pellis-serpentis, *Wood.*

Genus OXYSTELE, Philippi.

Shell conoidal, smooth, imperforate, umbilical region covered with a thin, porcellanous expansion of the columella; columella flat, trenchant, gradually blending with the thin outer lip.

Ex. O. merula, *Linnæus*, pl. 48, fig. 8. Operculum, O. merula, fig. 8, *a*, 8, *b*. Shell, O. merula, fig. 8, *c*.

In this genus the neck-lappet appears, from the figure

given by Poli, to be bifid, the side-membrane crenated, and the operculigerous lobe furnished with three tentacular filaments on each side. The outer lip of the shell is acute, and the umbilical region is not surrounded by a spiral callus ending in a point, as in *Chlorostoma*.

Species of Oxystele.

Adelaidæ, *Phil.*
fasciata, *Anton.*
fulgurata, *Phil.*
impervia, *Mke.*
indecora, *Phil.*
merula, *Chem.*
meruloides, *Krauss.*
perdix, *Koch.*
sagittifera, *Lam.*
sauciata, *Koch.*
Saulcyi, *D'Orb.*
suavis, *Phil.*
tabularis, *Krauss.*
tenera, *Trosch.*
tigrina, *Chem.*
variegata, *Anton.*

Genus PHOTINULA, H. and A. Adams.

Shell orbicular, depressed; whorls smooth, polished, usually transversely lineated, umbilical region covered with an impressed callus; aperture wide; inner lip convex, thick, ending in a simple point.

Syn. Margarita, sp. *Auct.* Photina, *H. and A. Adams* (olim), not *Burmeister*.

Ex. P. cærulescens, *King*, pl. 48, fig. 9. Operculum, P. cærulescens, fig. 9, *a*, 9, *b*.

This genus includes a small group of shells usually considered as species of *Margarita*, but which approach still nearer to the *Oxystele* of Philippi; the axis is imperforate, the inner lip is not acute, and the whorls are lineated and smooth.

Species of Photinula.

cærulescens, *King.*
expansa, *Sow.*
fusca, *A. Adams.*
lineata, *Gray.*
nigra, *A. Adams.*
Sandwichiana, *A. Adams.*
sigaretina, *Sow.*
tæniata, *Wood.*
violacea, *King.*

Genus CHLOROSTOMA, Swainson.

Shell conoidal, usually deeply umbilicated, or with the umbilical region covered by a callus; whorls smooth or longitudinally corrugated, the last generally keeled at the periphery; aperture oblique; inner lip with an acute tubercle at the fore part, continuous with a spiral ridge which encircles the umbilicus; outer lip angular at the base, usually with one or two tubercles.

Ex. C. argyrostoma, *Chemnitz*, pl. 49, fig. 1. Operculum, C. atrum, *Lesson*, fig. 1, *a*.

The peculiar feature in the shell of *Chlorostoma* is the spiral ridge which encircles the umbilical region and ends at the fore part of the inner, lip usually in a short tooth or tubercle; the shells are remarkable for their black or dingy colour.

Species of Chlorostoma.

argyrostoma, *Chem.*
atrum, *Lesson.*
bicanaliculatum, *Dkr.*
bicarinatum, *Pot. and Mich.*
brunneum, *Phil.*
castaneum, *A. Adams.*
leucostigma, *A. Adams.*
luctuosum, *D'Orb.*
lugubre, *Gmel.*
maculosum, *A. Adams.*
marginatum, *Nutt.*
mitra, *Anton.*
mœstum, *Jonas.*
nigerrimum, *Gmel.*

olivaceum, *Anton.*
Pfeifferi, *Phil.*
pulligo, *Martyn.*
rugosum, *A. Adams.*
rusticum, *Gmel.*
tridentatum, *Pot. and Mich.*
tropidophorum, *A. Adams.*

Genus OMPHALIUS, Philippi.

Shell turbinate, axis perforated; whorls with transverse series of granules, the last rounded at the periphery; umbilicus surrounded by a ring-like callus ending at the fore part of the inner lip in a tooth, often with several tubercles beyond it.

Ex. O. viridulus, *Gmelin*, pl. 49, fig. 2. Operculum, O. viridulus, fig. 2, *a*.

Omphalius, unlike *Polydonta*, is truly umbilicated, and the last whorl is rounded; the granular nature of the whorls will distinguish it from *Chlorostoma*, and the spiral callus round the umbilicus, and the whorls not being tumid, will separate it from *Gibbula;* the outer lip, moreover, is usually grooved internally.

Species of Omphalius.

Brazilianus, *Mke.*
Californicus, *A. Adams.*
canus, *Koch.*
carneus, *Gmel.*
cruciatus, *Chem.*
excavatus, *Lam.*
fasciatus, *Born.*
fuscescens, *Phil.*
granifer, *A. Adams.*
Gruneri, *Phil.*
Hottesserianus, *D'Orb.*
liratus, *A. Adams.*
maculo-striatus, *C.B. Adams.*
melaleucos, *Jonas.*
modestus, *Koch.*
nodicinctus, *A. Adams.*
quadricarinatus, *Gmel.*
quadricostatus, *Wood.*
scalaris, *Anton.*
scabriculus, *V. d. Busch.*
semigranosus, *A. Adams.*
sordidus, *Phil.*
sticticus, *A. Adams.*
viridulus, *Gmel.*

Sub-gen. ANADEMA, H. and A. Adams.

Shell conoidal, depressed; whorls with transverse rows of granules; umbilicus with a spiral callus, which gradually becomes broader, and blends with the outer lip; columella thin, simple; outer lip smooth internally.

cælata, *A. Adams.*

Genus MONILEA, Swainson.

Shell orbicular, depressed, whorls transversely grooved, axis widely perforated, umbilicus surrounded by a striated callus, last whorl rounded at the periphery; columella ending anteriorly in one or two tubercles.

Syn. Talopia, *Gray.*

Ex. M. calyculus, *Wood*, pl. 49, fig. 3. Operculum, M. calyculus, fig. 3, *a*, 3, *b*.

In this genus the umbilicus is furnished with a thick, spiral callus, dilated anteriorly where it joins the excavated columella, and with another striated, spiral callus more external, which ends anteriorly in a pointed tooth. In the sub-genus *Solariella* the internal callus is absent, and there is no external, striated callus.

Species of Monilea.

Benzi, *Krauss.*
callifera, *Lam.*
calyculus, *Wood.*
corrugata, *Koch.*
crenulata, *Mke.*
kalisoma, *A. Adams.*
lirata, *A. Adams.*
Menkei, *A. Adams.*
nucleus, *Phil.*
Philippii, *A. Adams.*
pusilla, *A. Adams.*
rigata, *Phil.*
Swainsonii, *A. Adams.*

Sub-gen. SOLARIELLA, Searles Wood.

Shell thin; whorls transversely finely striated; umbilicus perspective, the margin crenulated, no external striated callus.

angulata, *A. Adams.*
aureonitens, *A. Adams.*
delicata, *A. Adams.*
solariiformis, *Sow.*
vitigilinea, *Mke.*

Genus GIBBULA, Leach.

Shell conoidal, usually umbilicated, the umbilicus cylindrical or infundibuliform, whorls often superiorly gibbous; aperture sub-rhomboidal, with rounded angles, entire above, simple below; columella sometimes ending in a tubercle or tooth.

Syn. Phorcus, *Risso.* Steromphala, *Leach.*

Ex. G. Magus, *Linnæus*, pl. 49, fig. 4. Operculum, G. umbilicaris, *Linnæus*, fig. 4, *a*, 4, *b*. Shell G. Magus, fig. 4, *c*.

The species of *Gibbula* are very numerous, and are found in all parts of the world; the gibbosity of the whorls, the perforated axis, and simple termination of the columella serve to characterise the genus.

Species of Gibbula.

Adansonii, *Payr.*
Adriatica, *Phil.*
Agathensis, *Recluz.*
alveolata, *Phil.*
amœna, *Gould.*
ardens, *Salis.*
articulata, *A. Adams.*
balteata, *A. Adams.*
bicarinata, *Adams and Reeve.*
bicincta, *Phil.*
Candei, *D'Orb.*
Capensis, *Gmel.*
cineraria, *Linn.*
corvus, *Phil.*
crinita, *Phil.*
divaricata, *Linn.*

Gundlachi, *Phil.*
guttata, *Koch.*
helicoides, *Phil.*
instricta, *Gould.*
jucunda, *Gould.*
kalinota, *A. Adams.*
Kotschyi, *Phil.*
Lehmanni, *Mke.*
livido-maculata, *C. B. Ad.*
leucophæa, *Phil.*
leucosticta, *A. Adams.*
Magus, *Linn.*
Mindorensis, *A. Adams.*
multicolor, *Krauss.*
Nassaviensis, *Chem.*
nebulosa, *Phil.*
nivosa, *A. Adams.*
obtusa, *Chem.*
omphalium, *Phil.*
Philberti, *Recluz.*
pisum, *Phil.*
Preissiana, *Phil.*
punctata, *Anton.*
quadrata, *Gmel.*
rosea, *Gmel.*
scabra, *Linn.*
sulcosa, *A. Adams.*
tessellata, *A. Adams.*
tumida, *Mont.*
varia, *Linn.*
variegata, *Risso.*
venusta, *A. Adams.*
umbilicalis, *Da Costa.*
umbilicaris, *Linn.*
undosa, *A. Adams.*
usta, *Phil.*

Sub-gen. FORSKÄLIA, H. and A. Adams.

Shell turbinate; spire elevated, whorls nodosely plicate at the sutures, granulated, the last whorl with a conspicuous groove at the periphery.

declivis, *Forsk.*
familiaris, *Petiv.*
fanulum, *Gmel.*
pulcherrima, *A. Adams.*
puncto-costata, *A. Adams.*

Genus TROCHISCUS, Sowerby.

Operculum with the edges of the whorls elevated and scaly.

Shell orbicular, sub-discoidal, covered with an epidermis, solid, smooth, widely and deeply umbilicated; aperture nearly circular, peritreme not continuous; inner lip flattened and produced anteriorly; outer lip thin, acute.

Ex. T. Norrissii, *Sowerby*, pl. 49, fig. 5. Operculum, T. Norrissii, fig. 5, *a*, 5, *b*.

The operculum in this genus is remarkable for having the outer edge of each spiral volution free and membranous, with the margin curled. The axis of the shell is widely perforated, the spire is obtuse, the columella simple, and the whorls are smooth.

Genus MARGARITA, Leach.

Shell thin, usually without any colouring, globosely conoidal, umbilicated, whorls rounded, smooth or transversely striated; aperture nearly circular; columella ending in a simple point.

Ex. M. helicina, *Fabricius*, pl. 49, fig. 6. Operculum, M. helicina, fig. 6, *a*, 6, *b*. Shell, M. helicina, fig. 6, *c*.

The species of this genus are principally inhabitants of the shores of northern countries; they may be distinguished from *Gibbula* by the whorls being simple and rounded, and by the circular aperture, the interior of which is often brilliantly iridescent.

Species of Margarita.

acuminata, *Sow.*
argentata, *Gould.*
aspecta, *A. Adams.*
balteata, *A. Adams.*
biangulosa, *A. Adams.*
calostoma, *A. Adams.*
carinata, *A. Adams.*
cinerea, *Couth.*
cingulata, *A. Adams.*
coarctata, *Migh.*
costellata, *Sow.*
Cumingii, *A. Adams.*
dilecta, *A. Adams.*
helicina, *Fabr.*
Hillii, *Forbes.*
glauca, *Möll.*
Grönlandica, *Chem.*
ligata, *Gould.*
Magellanica, *Gould.*
minutissima, *Migh.*

multilineata, *De Kay.*
obscura, *Couth.*
ornata, *De Kay.*
Persica, *Gould.*
polytropa, *A. Adams.*
pupilla, *Gould.*
purpurata, *Forbes.*
striata, *Leach.*
sulcata, *Sow.*
tessellata, *A. Adams.*
umbilicalis, *Brod. and Sow.*
undulata, *Möll.*
Vahlii, *Möll.*
variabilis, *A. Adams.*
venusta, *Phil.*

Genus VITRINELLA, C. B. Adams.

Shell turbiniform, vitreous, minute, with a large, orbicular aperture; either umbilicated, or with the umbilical region deeply and widely indented.

Ex. V. valvatoides, *C. B. Adams*, pl. 49, fig. 7.

This genus comprises a group of small, transparent shells having large apertures, and rapidly-enlarging whorls; it consists of numerous species. "They are not the young of any other species, for the first one, or one and a half, whorls are distinguished from the following whorls by nuclear peculiarities, as want of sculpture, &c. We are acquainted with the young of all the larger species which inhabit the same localities, and none of them resemble these shells." (*C. B. Adams.*)

Species of Vitrinella.

anomala, *D'Orb.* (Rotella).
concinna, *C. B. Adams.*
exigua, *C. B. Adams.*
helicoidea, *C. B. Adams.*
hyalina, *C. B. Adams.*
interrupta, *C. B. Adams.*
Janus, *C. B. Adams.*
megastoma, *C. B. Adams.*
minuta, *C. B. Adams.*
modesta, *C. B. Adams.*
Panamensis, *C. B. Adams.*
parva, *C. B. Adams.*
perparva, *C. B. Adams.*
pusilla, *Pfeiff.* (Rotella).
regularis, *C. B. Adams.*
seminuda, *C. B. Adams.*

semistriata, *D'Orb.* (Rotella).
striata, *D'Orb.* (Rotella).
tincta, *C. B. Adams.*
tricarinata, *C. B. Adams.*
valvatoides, *C. B. Adams.*

Sub-fam. STOMATELLINÆ.

Foot often very thick, fleshy, developed posteriorly.

Operculum thin, horny, ovate, of few rapidly-increasing whorls, often entirely wanting.

Shell more or less ear-shaped, of few whorls; aperture very wide.

Genus STOMATELLA, Lamarck.

Animal spiral, retractile within the shell; frontal lobes triangular, their edge fringed; foot small, not tubercular, not posteriorly produced, operculigerous; lateral membrane very wide, the edge fimbriated.

Operculum orbicular, thin, horny, many-whorled.

Shell spiral, sub-orbicular, depressed, transversely ribbed or sulciferous; spire more or less elevated, whorls rounded; aperture large, wider than long.

Ex. S. maculata, *Quoy and Gaimard*, pl. 49, fig, 8, 8, *a*. Operculum, S. sulcifera, *Lamarck*, fig. 8, *b*, 8, *c*. Shell, S. imbricata, *Lamarck*, fig. 8, *d*.

The *Stomatellæ* are most numerous in the Philippines, sixteen species being inhabitants of those islands.

Species of Stomatella.

Arabica, *A. Adams.*
articulata, *A. Adams.*
Baconi, *A. Adams.*
bicarinata, *A. Adams.*
biporcata, *A. Adams.*
calliostoma, *A. Adams.*
cancellata, *Krauss.*
candida, *A. Adams.*

clathratula, *A. Adams.*
coccinea, *A. Adams.*
compta, *A. Adams.*
costellata, *A. Adams.*
decolorata, *Gould.*
decorata, *A. Adams.*
elegans, *Gray.*
fulgurans, *A. Adams.*
haliotidea, *Sow.*
imbricata, *Lam.*
inflata, *C. B. Adams.*
maculata, *Quoy and Gaim.*
Malukana, *A. Adams.*
margaritana, *A. Adams.*
monilifera, *A. Adams.*
notata, *A. Adams.*
orbiculata, *A. Adams.*
pallida, *A. Adams.*
papyracea, *Chem.*
rufescens, *Gray.*
sanguinea, *A. Adams.*
selecta, *A. Adams.*
speciosa, *A. Adams.*
sulcifera, *Lam.*
tigrina, *A. Adams.*

Genus STOMATIA, Helbling.

Animal spiral, too large entirely to enter the shell; frontal lobes digitated; foot large, tubercular, greatly produced behind, lateral membrane fringed, ending anteriorly, on the left side, in a fimbriated crest under the eye-pedicel, and on the right, in a slightly-projecting fold or gutter leading to the respiratory cavity.

Operculum none.

Shell sub-spiral, oblong, or sub-orbicular; spire prominent, whorls plicated at the suture, carinated or tubercular; aperture wider than long, pearly within.

Syn. Haliotidea, *Humph.*, not *Swains.* Stomax, *Montf.* Sigaretus, *Schum.*, not *Lam.* or *Cuv.*

Ex. S. rubra, *Lamarck*, pl. 49, fig. 9, 9, *a*, 9, *b*. Shell, S. phymotis, *Helbling*, fig. 9, *c*.

Stomatia, like *Harpa* and some Nudibranchs, has the power of spontaneously throwing off the hind part of the foot when the animal is irritated, and *Gena* exhibits the same peculiarity; specimens in spirits have the foot usually truncated from this cause. The species of *Stomatia* are

most numerous in the Philippines, the majority having been discovered in those Islands by the indefatigable Mr. Cuming; their favourite locality is on coral reefs, but they are also found under stones at low-water.

Species of Stomatia.

acuminata, *A. Adams.*
angulata, *A. Adams.*
decussata, *A. Adams.*
duplicata, *Sow.*
phymotis, *Helbl.*
rubra, *Lam.*
splendidula, *A. Adams.*

Genus MICROTIS, A. Adams.

Animal as in *Stomatia*, but the foot with a deep, anterior fissure for the head, and with the front edge bilobed.

Operculum none.

Shell spiral, sub-orbicular, depressed, with two tuberculated ridges; spire slightly prominent; aperture very large, wider than long; columellar margin spiral, visible as far as the apex of the spire.

Ex. M. tuberculata, *A. Adams*, pl. 50, fig. 1, 1, *a*, 1, *b*. Shell, M. tuberculata, fig. 1, *c*.

The shell of *Microtis* resembles that of a little *Haliotis* without the perforations; the foot of the animal being fissured in front, and the spiral columella of the shell, distinguish the genus, of which there is but a single species at present known.

Genus GENA, Gray.

Animal sub-spiral, oval, depressed, too large to enter the shell; frontal lobes plumose; foot very large, tubercular, posteriorly produced; lateral membrane not fringed, more or less extended and partially covering the shell.

Operculum none.

Shell sub-spiral, oblong, ear-shaped, depressed, smooth or striated; spire flattened, nearly obsolete; aperture large.

Syn. Stomatella, *b. Blainv.*

Ex. G. planulata, *Lamarck*, pl. 50, fig. 2, 2, *a.* Shell, G. lutea, *Linnæus*, fig. 2, *b.*

Thirteen species of this genus were discovered by Mr. Cuming among the Islands of the Philippine Archipelago, where they appear to represent *Haliotis.*

Species of Gena.

asperulata, *A. Adams.*
concinna, *Gould.*
irasata, *Dufo.*
lineata, *A. Adams.*
lintricula, *A. Adams.*
lutea, *Linn.*
minima, *Dufo.*
nebulosa, *A. Adams.*
nigra, *Quoy and Gaim.*
ornata, *A. Adams.*
planulata, *Lam.*
plumbea, *A. Adams.*
pulchella, *A. Adams.*
striatula, *A. Adams.*
strigosa, *A. Adams.*
varia, *A. Adams.*

Genus BRODERIPIA, Gray.

Shell non-spiral, ancyliform, oblong, ovate, flattened; apex posterior, sub-involute; aperture very large, oval, iridescent and nacreous within.

Syn. Scutella, sp. *Brod.*

Ex. B. rosea, *Broderip*, pl. 50, fig. 3.

The small and singular genus *Broderipia* is known only by its shell, which differs from that of the rest of the genera in the family in not being spiral; three species only are known, all natives of the Philippines.

Species of Broderipia.

Cumingii, *A. Adams.*
iridescens, *Brod.*
rosea, *Brod.*

Genus ANATOMUS, Montfort.

Operculum thin, horny, sub-spiral.

Shell minute, spiral, heliciform, depressed, widely umbilicated; spire short; aperture sub-orbicular, not pearly within; outer lip with a narrow fissure or slit.

Syn. Scissurella, *D'Orb.*

Ex. A. crispatus, *Fleming*, pl. 50, fig. 4.

The animal of *Anatomus* has not hitherto been accurately observed, so that the systematic position of the genus is rather doubtful. The aperture of the shell is not nacreous or pearly internally; the fissure in the outer lip is sometimes incomplete. Montfort, speaking of his *A. Indicus*, observes that it inhabits the Sargassa or Gulf-weed.

Species of Anatomus.

angulatus, *Sow.*
asper, *Phil.*
Bertheloti, *Webb.*
conicus, *D'Orb.*
costatus, *D'Orb.*
crispatus, *Flem.*
D'Orbignyi, *Audouin.*
Indicus, *Montf.*
lævigatus, *D'Orb.*
striatulus, *Phil.*
reticulatus, *Phil.*

Fam. HALIOTIDÆ.

Tongue with a small median tooth, flanked by two beam-like laterals and numerous uncini with denticulated hooks,

the four inner being very large. Head with a short, broad muzzle; tentacles subulate, with the eyes on stout, cylindrical peduncles at their outer bases, and with a fimbriated lobe, or an emarginate veil, between them. Mantle-margin fissured in front, the left lobe elongated into an anal siphon occupying the anterior perforation of the shell; gills two, unequal. Foot thick and fleshy, the sides with a double membrane, furnished with serrated lobes and filaments on the edges, and continued, anteriorly, in a free crest, under the head.

Operculum none.

Shell ear-shaped; aperture large, nacreous and iridescent internally, perforated with a series of holes.

In the family of *Haliotidæ* or "Ear-shells," we find the lingual dentition very similar to that of the *Trochidæ*, the eyes, moreover, are pedunculated, and there are analogous head-lobes and lateral fringes; there are, however, two branchial plumes, and the muscle of attachment, instead of being crescentic round the mantle, is central and ovate. In the perforated shell and double gill, as well as in the great development of the foot, this family seems to resemble that of *Fissurellidæ*, but the shell is subspiral, and the aperture is lined with an iridescent nacre.

Genus HALIOTIS, Linnæus.

Foot moderate, not grooved and produced posteriorly.

Shell depressly ovate, or ear-shaped; spire small, obtuse, sub-lateral, surface rough, wrinkled, or tubercular; aperture very wide, broader than long, iridescent and pearly within, the left side perforated with a series of holes.

Syn. Auris, *Klein*, not *Spix.* ? Deridobranchus, *Ehrenb.* Ralia, *Gray.* Haliotidarius, *Dum.*

Ex. H. glabra, *Chemnitz*, pl. 50, fig. 5, 5, *a.* Shell, H. tuberculata, *Linnæus*, fig. 5, *b.*

The species of this genus, remarkable for the beauty and variety of colour of their shells, are most numerous in Australia, where they appear to take the place of the *Chitonidæ*, which are most abundant along the shores of America. Species of *Haliotis*, however, are found in various parts of the world, the Cape, India, China, California, New Zealand, and the Canaries. One species, *H. tuberculata*, is eaten in the Channel Islands, and others constitute an indifferent article of diet in Japan and China. Great quantities of *Haliotis* are brought to Birmingham for the manufacture of the "mother-of-pearl" ornaments used in "papier maché" articles.

Species of Haliotis.

albicans, *Quoy.*
ancile, *Reeve.*
aquatilis, *Reeve.*
astricta, *Reeve.*
bistriata, *Gmel.*
Californiensis, *Swains.*
coccinea, *Reeve.*
coccoradiata, *Reeve.*
concinna, *Reeve.*
corrugata, *Gray.*
Cracherodi, *Leach.*
crispata, *Gould.*
cruenta, *Reeve.*
Cunninghami, *Gray.*
discors, *Reeve.*
diversicolor, *Reeve.*
elegans, *Koch.*
fulgens, *Phil.*
funebris, *Reeve*
gemma, *Reeve.*
gibba, *Phil.*
gigantea, *Chem*
glabra, *Chem.*
iris, *Martyn.*
Jacuensis, *Reeve.*
Kamtschatkana, *Jonas.*
lamellosa, *Lam.*
lauta, *Reeve.*
Mariæ, *Gray.*
marmorata, *Gray.*
Midæ, *Linn.*
multiperforata, *Reeve.*

nebulata, *Reeve.*
pertusa, *Reeve.*
planilirata, *Reeve.*
pustulata, *Reeve.*
rubiginosa, *Reeve.*
rufescens, *Swains.*
rugosa, *Reeve.*
rugoso-plicata, *Chem.*
scutulum, *Reeve.*
semistriata, *Reeve.*
sepiculata, *Reeve.*
Sieboldii, *Reeve.*
squamata, *Reeve.*
squamosa; *Gray.*
Tayloriana, *Reeve.*
tuberculata, *Linn.*
varia, *Linn.*
viridis, *Reeve.*
Zealandica, *Reeve.*
zic-zac, *Reeve.*

Genus TEINOTIS, H. & A. Adams.

Foot very large and thick, greatly produced, and with a deep, superior, longitudinal groove posteriorly.

Shell depressed, elongate, ear-shaped; spire sub-spiral, posterior, produced beyond the last whorl; aperture very large, much wider than long, pearly within and perforated with a series of holes.

Syn. Haliotis, *Montf.*, not *Linn.*

Ex. T. asinina, *Linnæus*, pl. 50, fig. 6, 6, *a*. Shell, T. asinina, fig. 6, *b*.

Teinotis, in its development of foot and consequent greater locomotive power, seems to bear the same relation to the other genera of this family that *Cryptoplax* does among the *Chitonidæ*. As in *Haliotis*, the anal lobe of the mantle-margin is protruded from the last-formed perforation of the shell, the other holes progressively closing with the growth of the shell. The *Teinotis* lives among the rocks and reefs along the shore, and crawls with considerable vivacity; in the typical species, the lateral membrane of the foot, when fully expanded, is slightly reflexed over the dorsal surface of the shell.

Species of Teinotis.

asinina, *Linn.*
stomatellæformis, *Reeve.*

Genus PADOLLUS, Montfort.

Shell depressed, ear-shaped; spire small, sub-lateral, surface corrugated or tubercular, with a prominent, spiral ridge in the middle; aperture very large, pearly within, perforated with a few holes, and with a deep furrow parallel with the series of perforations.

Syn. Padolla, *Oken.* Padola, *Flem.*

Ex. P. tricostalis, *Chemnitz*, pl. 50, fig. 7.

The chief peculiarity of this genus consists in the groove which runs parallel with the line of perforations in the shell, and which, doubtless, is attended with a corresponding peculiarity in the animal; the species are from Africa and New Holland.

Species of Padollus.

clathratus, *Reeve.*
Dringii, *Reeve.*
Emma, *Gray.*
excavatus, *Lam.*
nævosus, *Martyn.*
ovinus, *Chem.*
papulatus, *Reeve.*
pulcherrimus, *Martyn.*
Roei, *Gray.*
tricostalis, *Chem.*
venustus, *Adams and Reeve.*

Sub-gen. SULCULUS, H. and A. Adams.

Shell with an elevated dorsal ridge, running parallel with the row of perforations; aperture with a corresponding spiral depression; apex sub-spiral, the spire nearly terminal.

incisus, *Reeve.*
Janus, *Reeve.*
parvus, *Linn.*
reticulatus, *Reeve.*

rosaceus, *Reeve.*
sanguineus, *Hanley.*
speciosus, *Reeve.*
striatus, *Linn.*
virgineus, *Chem.*

Sub-order EDRIOPHTHALMA.

Eyes sessile, or on slightly-raised tubercles on the outer side of the base of the tentacles. Operculum none. Shell, in the adult, symmetrical, conical, not spiral; aperture not pearly internally.

Fam. FISSURELLIDÆ.

Tongue with a central median tooth, five denticulated uncini, and numerous, slender, hooked laterals. Body broad and conical. Head with a short, wide muzzle; tentacles subulate, with the eyes on slightly-elevated tubercles at their external bases. Mantle-margin fissured in front, the free edges forming an anal siphon occupying the anterior fissure or perforation in the apex of the shell; gills two, symmetrical, on the back of the neck. Foot dilated, sides with the upper part furnished with a series of short cirrhi or rudimentary filaments.

Operculum none.

Shell, in the adult, conical, symmetrical, not spiral, either pierced at the apex, or more or less grooved or fissured anteriorly; aperture wide, not pearly within; muscular impression crescentic, open in front.

The animals composing this family, like those of the Scutibranch Gasteropods generally, are littoral and phytophagous in their habits. In their lingual dention, and in the sides of their foot being ornamented with cirrhi, they

exhibit an affinity with the *Trochidæ* and *Haliotidæ*, but their eyes are not situated at the ends of separate peduncles, and their shells are not nacreous or pearly within. The nucleus is always spiral, although, in the adult, the shell assumes a conic form; in some genera there is a rudimentary spire in the young state, which disappears in the course of growth. The perforation or fissure of the shell, though sometimes regarded as branchial, is undoubtedly fæcal in its office.

Genus FISSURELLA, Bruguière.

Mantle-margin fringed with cirrhi; anal siphon a short, truncate, membranous canal, projecting from the perforation in the shell.

Shell oval, conical, depressed, surface radiated or cancellated; apex truncate and perforated in front of the centre; aperture wide, expanded, oblong, simple internally.

Syn. Larva, *Humph.*, not *Veill.* Caminata, *Fabr.* Fissurellus, *Montf.* Serra, *Less.*

Ex. F. maxima, *Sowerby*, pl. 51, fig. 1. Shell, F. picta, *Gmelin*, fig. 1, *a*.

In the young shell the apex is entire and sub-spiral, and the perforation is situated in the same position in which it exists permanently. The species are found in nearly all countries, but are most numerous along the coasts of South America.

Species of Fissurella.

atrata, *Reeve.*
bella, *Reeve.*
biradiata, *Fremb.*
Bridgesii, *Reeve.*
catillus, *Reeve.*
Chilensis, *Sow.*
clypeus, *Sow.*
costata, *Less.*

crassa, *Lam.*
crenifera, *Sow.*
Cumingii, *Reeve.*
Darwinii, *Reeve.*
exquisita, *Reeve.*
galericulum, *Reeve.*
grandis, *Sow.*
grisea, *Reeve.*
Hondurasensis, *Reeve.*
lata, *Sow.*
latimarginata, *Sow.*
limbata, *Sow.*
maxima, *Sow.*
Mexicana, *Sow.*
mutabilis, *Sow.*
nigra, *Less.*
nimbosa, *Linn.*
orieus, *Sow.*
Philippiana, *Reeve.*
picta, *Gmel.*
pulchra, *Sow.*
radiosa, *Less.*
rota, *Reeve.*
rudis, *Desh.*
sagittifera, *Reeve.*
stellata, *Reeve.*
virescens, *Sow.*

Sub-gen. CREMIDES, H. and A. Adams.

Shell conical, surface rough, muricated or cancellated; aperture with the margin denticulated.

alabastrites, *Reeve.*
asperella, *Sow.*
balanoides, *Reeve.*
Barbadensis, *Gmel.*
coarctata, *King.*
compressa, *Reeve.*
conoides, *Reeve.*
edititia, *Reeve.*
glaucopis, *Reeve.*
Humphreyi, *Reeve.*
macrotrema, *Sow.*
microtrema, *Sow.*
muricata, *Reeve.*
Natalensis, *Krauss.*
nigro-punctata, *Sow.*
nodosa, *Born.*
obscura, *Sow.*
obtusa, *Sow.*
olivacea, *Gray.*
ostrina, *Reeve.*
Peruviana, *Lam.*
rugosa, *Sow.*
Tongana, *Quoy.*
volcano, *Reeve.*

Sub-gen. FISSURIDEA, Swainson.

Shell sub-conical, cap-shaped, the apex close to the posterior margin; perforation narrow.

pileus, *Swains.* (pileopsoides, *Reeve*).

Genus LUCAPINA, Gray.

Mantle-margin fimbriated, reflexed more or less over the edges of the shell.

Shell oblong, oval, depressly conical, surface cancellated; apex sub-central, with an oval perforation; aperture expanded, the margin crenulated; perforation surrounded by a callus, truncated posteriorly, and sometimes produced into a transverse lamella.

Ex. L. reticulata, *Donovan*, pl. 51, fig. 2. Shell, L. crenulata, *Sowerby*, fig. 2, *a*.

This genus includes all those reticulated and cancellated forms, generally referred to *Fissurella*, which have the margin of the aperture crenulated, and in which the perforation, internally, is transversely truncate and sometimes slightly concamerated.

Species of Lucapina.

ægis, *Reeve.*
alta, *C. B. Adams.*
alternata, *Say.*
aspera, *Sow.*
australis, *Krauss.*
Benguelensis, *Dkr.*
calyculata, *Sow.*
cancellata, *Soland.*
candida, *Sow.*
Cayennensis, *Lam.*
crenulata, *Sow.*
cruciata, *Krauss.*
cyathulum, *Reeve.*
densiclathrata, *Reeve.*
digitale, *Reeve.*
Dysoni, *Reeve.*
elongata, *Phil.*
excelsa, *Adams and Reeve.*
fimbriata, *Reeve.*
fumata, *Reeve.*
funiculata, *Reeve.*
gemmulata, *Reeve.*
gibberula, *Lam.*
inæqualis, *Sow.*
Incei, *Reeve.*
indusica, *Reeve.*
Jukesii, *Reeve.*
larva, *Reeve.*
lentiginosa, *Reeve.*
Lincolni, *Gray.*
Menkeana, *Dkr.*
Metcalfii, *Reeve.*

neglecta, *Desh.*
nigro-ocellata, *Reeve.*
nigro-radiata, *Reeve.*
octagona, *Reeve.*
Panamensis, *Sow.*
Philippiana, *Dkr.*
pica, *Sow.*
quadriradiata, *Reeve.*
reticulata, *Donov.*
Rüppellii, *Sow.*
Sieboldii, *Reeve.*
Singaporensis, *Reeve.*
solida, *Phil.*
suffusa, *Reeve.*
tegula, *Reeve.*
Ticaonica, *Reeve.*
venusta, *Reeve.*
viminea, *Reeve.*
viridula, *Lam.*

Genus CLYPIDELLA, Swainson.

Mantle-margin double, the edges scalloped and fringed, anal siphon surrounded by a fimbriated membrane; foot large, fleshy and tubercular, with a series of rudimentary, tentacular filaments on the sides near the fore part.

Shell ovate, scutiform, surface rugose, the anterior extremity slightly elevated, truncate and sub-emarginate; perforation large, situated near the fore part of the shell.

Ex. C. pustula, *Linnæus*, pl. 51, fig. 3. Shell, C. pustula, fig. 3, *a*.

In this genus the sides of the shell are covered by the upper fold of the double-edged mantle, the anal siphon is encircled by a fringed and plicate membranous expansion, and the foot is fleshy and tubercular.

Species of Clypidella.

aculeata, *Reeve.*
Baikiei, *A. Adams.*
dubia, *Reeve.*
fascicularis, *Lam.*
pustula, *Linn.*
salebrosa, *Reeve.*
scutella, *Gray.*

Genus FISSURELLIDÆA, D'Orbigny.

Mantle greatly developed, thickened at the edges, and nearly covering the shell; foot very large and elongated.

Shell oval, depressed, surface nearly smooth; perforation oval, large, central, with an internal, thickened rim round the margin; aperture very wide, with a thickened callus round the inner margin, margin smooth.

Ex. F. hiantula, *Lamarck*, pl. 51, fig. 4. Shell, F. hiantula, fig. 4, *a*.

In this genus the animal is of large size compared with the shell, and the mantle is thick and almost coriaceous; there appear to be but few species, inhabitants of the Cape, Tasmania, and South America.

Species of Fissurellidæa.

æqualis, *Sow.*
Chemnitzii, *Sow.*
hiantula, *Lam.*
nigrita, *Sow.*

Genus MACROCHISMA, Swainson.

Shell scutiform, elongated, surface radiately striated, anterior extremity elevated, sub-emarginate, grooved above; perforation large, ovate or lanceolate, elongate or oblong, situated near the front edge.

Ex. M. maxima, *A. Adams*, pl. 51, fig. 5.

In this genus the animal, according to the observations of Mr. Cuming, is of large size, larviform and greatly elongated, with the shell situated towards the hinder extremity. The anal aperture or fæcal perforation of the

shell is much nearer the front margin than in the other genïera of the family.

Species of Macrochisma.

angustata, *A. Adams.*
compressa, *A. Adams.*
cuspidata, *A. Adams.*
dilatata, *A. Adams.*
hiatula, *Swains.*
maxima, *A. Adams.*
megatrema, *A. Adams.*
producta, *A. Adams.*

Genus PUPILLIA, Gray.

Mantle coriaceous, entirely covering the shell, orifice of anal siphon small, oblong, at the anterior third; foot granulated, shorter than the mantle.

Shell internal, depressly-conical, surface nearly smooth; perforation large, oblong, sub-central; aperture wide, ovate, the margin entire, double, sharp, white-limbed.

Syn. Pupillæa, *Krauss.* Pupillaca, *Phil.*

Ex. P. apertura, *Born*, pl. 51, fig. 6. Shell, P. apertura, fig. 6, *a*, 6, *b*.

The striking peculiarity of this genus is the fact of the shell being entirely covered and concealed by the mantle. The shell may readily be known by the sharp-edged, white border, which is received into the integument of the animal, like one of the valves of a *Chiton*. *Pupillia apertura* is an inhabitant of South Africa.

Genus CEMORIA, Leach.

Mantle-margin simple, anal siphon prominent, tubular, with six papillæ in front, and four behind; foot with a rudimentary, operculigerous lobe.

Shell ovate, conical, elevated, surface with radiating ribs; apex entire, sub-spiral, slightly recurved posteriorly; perforation linear, between the apex and front edge, vaulted over internally by a shelly plate; aperture oval, expanded, the margin entire.

Syn. Sipho, *Brown*, not *Klein*. Diadora, *Gray*. Rimula, *Lovén*, not *Defrance*. Puncturella, *Lowe*.

Ex. C. Noachina, *Linnæus*, pl. 51, fig. 7, 7, *a*, 7, *b*. Shell, C. Noachina, fig. 7, *c*, 7, *d*.

The range of cirrhi on the sides of the foot in this genus is interrupted, behind, on each side; the species inhabit the British Islands, Greenland, Norway, Boreal America, and Tierra del Fuego.

Species of Cemoria.

cognata, *Gould*.
conica, *D'Orb*.
cucullata, *Gould*.
fastigiata, *A. Adams*.
galeata, *Gould*.
Noachina, *Linn*.
princeps, *Gould*.

Genus RIMULA, Defrance.

Shell ovate, depressly-conical, thin, surface cancellated; apex recurved towards the hinder extremity, entire; perforation elongate, fissure-like, between the vertex and the front edge.

Syn. Rimularia, *Defrance*. Rimulus, *D'Orb*. Ditremaria, *D'Orb*.

Ex. R. exquisita, *A. Adams*, pl. 51, fig. 8.

This genus was founded on some fossil species of the Bath Oolite; several recent species, however, have been discovered by Mr. Cuming among the Islands of the

Philippine Archipelago, principally dredged from ten to twenty-five fathoms water. The genus is easily recognised by the position of the perforation.

Species of Rimula.

Blainvillii, *Defr.*
carinata, *A. Adams.*
exquisita, *A. Adams.*
propinqua, *A. Adams.*

Genus EMARGINULA, Lamarck.

Mantle-margin simple, reflexed over the edges of the shell, anal siphon with prominent, membranous margins, projecting from the fissure in the shell; foot with a rudimentary, operculigerous lobe.

Shell oval, conical, surface radiated or cancellated; apex entire, recurved posteriorly; aperture oval, expanded, the front edge fissured, the fissure continuous with a groove which extends as far as the vertex.

Syn. Emarginulus, *Montf.* ? Palmarium, *Montf.*

Ex. E. rosea, *Bell*, pl. 51, fig. 9. Shell, E. crassa, *Sowerby*, fig. 9, *a*.

The angulated sides of the anal siphon are seen, in the living animal, projecting from the fissure in the front margin of the shell; the operculigerous lobe exists in the form of a single, central cirrhus on the hind part of the foot. Most of the species are from considerable depths, while the species of *Fissurella*, on the contrary, are chiefly littoral. Australia, the West Indies, and the Philippines harbour the greatest number, a few only being inhabitants of temperate climates.

Species of Emarginula.

alveolata, *A. Adams*
Arabica, *A. Adams.*
cancellata, *Phil.*
catillus, *A. Adams.*
crassilabrum, *A. Adams.*
crassa, *Sow.*
cratitia, *A. Adams.*
curvirostris, *Desh.*
denticulata, *A. Adams.*
fissura, *Linn.*
fissurata, *Chem.*
galeata, *A. Adams.*
Huzardii, *Payr.*
imbricata, *A. Adams.*
lata, *Quoy.*
pumila, *A. Adams.*
reticulata, *Chem.*
rosea, *Bell.*
rubra, *Lam.*
sculptilis, *A. Adams.*
scutellaris, *A. Adams.*
striatula, *Quoy.*
Vanicorensis, *Quoy.*

Sub-gen. SUBEMARGINULA, Blainville (Hemitoma, *Swains.* Montfortia, *Recluz*).

Shell radiately ribbed, tubercular; aperture not fissured anteriorly, but with a conspicuous groove or gutter at the front edge.

depressa, *Blainv.*
nodulosa, *A. Adams.*
octoradiata, *Gmel.*
polygonalis, *A. Adams.*
tricarinata, *Born.*

Sub-gen. CLYPIDINA, Gray.

Shell ovate, depressly-conical, surface rugose or spiny; aperture not fissured anteriorly, but with an internal canal extending from the right side of the front margin to the vertex.

acuminata, *A. Adams.*
annulata, *A. Adams.*
aspera, *Gould.*
candida, *A. Adams.*
fungina, *Gould.*
notata, *Linn.*
parmophoroidea, *Quoy and Gaim.*
rudis, *A. Adams.*
stellata, *A. Adams.*
sulcifera, *A. Adams.*

Genus SCUTUS, Montfort.

Mantle-margin simple, permanently more or less produced and covering the sides of the shell; foot moderate, smooth, with a series of short, lateral cirrhi.

Shell depressed, oblong, shield-shaped, surface smooth or striated; apex at the hinder third; aperture with the front edge truncate, arched, and slightly emarginate, with an internal groove leading to the sinus; margin smooth, rounded behind.

Syn. Dascinus, *Rafin.* Parmophorus, *Blainv.* Parmophora, *Desh.* Scutifera, *Blainv.* Scutum, *Sow. jun.*

Ex. S. unguis, *Linnæus*, pl. 51, fig. 10. Shell, S. unguis, fig. 10, *a*.

The animal of *Scutus* does not differ much from that of *Emarginula*, but the shell is not fissured anteriorly, and is, moreover, smooth, depressed, and sub-quadrangular, with the margin permanently covered by the reflexed border of the mantle. The shells are all white or devoid of colour, although the animal is black; the species are found in shallow water, and are not very numerous; they are chiefly inhabitants of the Philippines, Australia, and New Zealand.

Species of Scutus.

angustatus, *A. Adams.*
australis, *Blainv.*
corrugatus, *Reeve.*
elongatus, *Lam.*
granulatus, *Blainv.*
imbricatus, *Quoy and Gaim.*
tumidus, *Quoy and Gaim.*
unguis, *Linn.*

Sub-gen. TUGALI, Gray.

Shell white, oblong, surface cancellated; aperture with the margin crenulated.

carinatus, *A. Adams.*
cicatrosus, *A. Adams.*
cinereus, *Gould.*
decussatus, *A. Adams.*
elegans, *Gray.*
osseus, *Gould.*
radiatus, *A. Adams.*

Fam. DENTALIIDÆ.

Lingual ribbon wide, ovate, rachis single-toothed, uncini single, flanked by single, unarmed plates. Body elongated; head rudimentary, without tentacles or eyes; mouth with cirrhated lips. Mantle circular, anteriorly thick and fleshy, investing the fore part of the body; gills two, symmetrical. Foot rudimentary, small, conical, with two symmetrical side-lobes, and an attenuated, hollow base, communicating with the stomach.

Operculum none.

Shell elongate, or elevately-conical, surface smooth or longitudinally striated; vertex perforated, posteriorly inclined; aperture circular, not constricted.

According to the observations of Clark, the blood of these animals is red, the sexes are united, and the gills are posterior to the heart. Should these views be confirmed, the family must be removed from the Prosobranchiate division of Mollusks. The most usual way of regarding the *Dentaliidæ* has been to consider them as elongated *Fissurellæ*, with the eyes and tentacles wanting, and the foot rudimentary and tubular; the perforated,

small end of the shell, corresponding with the orifice in the vertex of *Fissurella*, and subserving the same purpose. The stomach of the *Dentaliidæ* is furnished with a strong gizzard, and the vent is sub-central.

Genus DENTALIUM, Linnæus.

Shell symmetrical, tubular, tapering, recurved, surface longitudinally ribbed or striated; apex perforated, perforation entire, without any fissure or emargination; aperture circular.

Syn. Tubulus, *Scilla.* Dentale, *List.* Dentalis, *Llwyd.* Syringites, *Auct.* Canalis, *D'Argenv.* Cañalites, *Vogel.*

Ex. D. vulgare, *Da Costa*, pl. 52, fig. 1. Shell, D. arcuatum, *Linnæus*, fig. 1, *a.*

According to Clark, the "Tooth Shells," as they are often termed, are animal feeders, devouring with avidity *Foraminifera*, and sometimes small bivalves. They are usually found in deep water, and often bury themselves in mud and sand.

Species of Dentalium.

abbreviatum, *Desh.*
alternatum, *Lea.*
ambiguum, *Chenu.*
aprinum, *Linn.*
arcuatum, *Linn.*
dentalis, *Linn.*
elephantinum, *Linn.*
ellipticum, *Sow.*
fasciatum, *Gmel.*
formosum, *Adams and Reeve.*
giganteum, *Brug.*
Indicum, *Chenu.*
Lessoni, *Desh.*
lacteum, *Desh.*
multistriatum, *Desh.*
nigrum, *Lam.*
Novæ Hollandiæ, *Chenu.*
novem-costatum, *Lam.*
octogonum, *Lam.*
Panormum, *Chenu.*
politum, *Linn.*
pseudo-sexagonum, *Desh.*

quinquangulare, *Forbes.*
rectum, *Linn.*
rubescens, *Desh.*
striatulum, *Gmel.*
sulcatum, *Lam.*
translucidum, *Desh.*
variabile, *Desh.*
vulgare, *Da Costa.*

Genus ANTALIS, Aldrovandus.

Shell symmetrical, tubular, sub-cylindrical, recurved; apex perforated, perforation with a notch-like fissure on the dorsal or posterior margin; aperture circular, entire.

Syn. Antalium, *Auct.* Entale, *Tournef.* Entalites, *Auct.* Entalium, *Defr.* Entalis, *G. B. Sow., jun.*

Ex. A. semistriolata, *Guilding*, pl. 52, fig. 2. Shell, A. entalis, *Linnæus*, fig. 2, *a.*

In this genus the fæcal foramen in the apex of the shell is fissured on the hinder margin, and the surface of the shell is smooth or longitudinally striated. The species often range from 10 to 100 fathoms, and are found in the East and West Indies, the Mediterranean, and on the shores of Britain and Norway.

Species of Antalis.

Delessertiana, *Chenu.*
diffusa, *Chenu.*
eburnea, *Linn.*
entalis, *Linn.*
fissura, *Lam.*
incisa, *Chenu.*
inversa, *Desh.*
Lamarckii, *Chenu.*
nebulosa, *Desh.*
occidentalis, *Stimp.*
Philippii, *Chenu.*
secta, *Desh.*
semistriolata, *Guild.*
Sowerbyi, *Chenu.*
striata, *Lam.*
striolata, *Stimp.*

Fam. TECTURIDÆ.

Lingual riband long, with two central, and two hooked lateral teeth on each side in an oblique line, the inner often the larger. Head with a short muzzle; mouth with cartilaginous jaws; tentacles subulate; eyes on bulgings at their outer bases. Mantle-margin simple or fringed; gill forming a single pectinated plume on the side of the back of the neck. Foot large, ovate, with a simple, impressed groove.

Operculum none.

Shell depressed, conical, or cap-shaped; aperture wide, with a crescentic, muscular impression, interrupted in the region of the head.

The family of *Tecturidæ*, or "False Limpets," is distinguished from that of the *Patellidæ*, or "True Limpets," by the gill being single, and situated in a cavity on the right side of the neck, instead of forming a series of lamellæ between the mantle and foot. They are littoral in their habits, feeding on the sea-weed between tide-marks; their locomotion is very limited, and in their geographical distribution, they are found both in tropical and temperate countries.

Genus TECTURA, Audouin and Milne Edwards.

Mantle-margin fringed; foot oval, flat.

Shell patelliform, regular, depressly-conical, surface smooth or with radiating striæ; apex anterior, sub-central; aperture very wide, muscular impression non-symmetrical, the anterior part under the right side.

Syn. Acmæa, *Eschscholtz.* Patelloida, *Quoy and Gaimard.* Lottia, *Gray.*

Ex. T. testudinalis, *Müller,* pl. 52, fig. 3, 3, *a.* Shell, T. testudinalis, fig. 3, *b.*

Species of *Tectura* are found in Western America, Australia, and on the shores of northern countries; they range from low-water to thirty fathoms.

Species of Tectura.

æruginosa, *Midd.*
alveus, *Couth.*
ancylus, *Esch.*
araneosa, *Gould.*
Asmi, *Midd.*
cassis, *Eschr.*
conoidea, *Quoy and Gaim.*
conspicua, *Phil.*
cymbiola, *Gould.*
digitalis, *Eschr.*
discors, *Phil.*
elongata, *Quoy and Gaim.*
flammea, *Quoy and Gaim.*
fragilis, *Quoy and Gaim.*
fungus, *Meusch.*
leucopleura, *Gmel.*
limbata, *Phil.*
melanoleuca, *Gmel.*
melanosticta, *Gmel.*
mitella, *Mke.*
orbicularis, *Quoy and Gaim.*
parasitica, *D'Orb.*
patina, *Eschr.*
persona, *Eschr.*
personoides, *Midd.*
pileolus, *Midd.*
pileopsis, *Quoy and Gaim.*
pintadina, *Gmel.*
pustula, *Helb.*
rugosa, *Quoy and Gaim.*
scabra, *Gould.*
septiformis, *Quoy and Gaim.*
squamosa, *Quoy and Gaim.*
stellaris, *Quoy and Gaim.*
striata, *Quoy and Gaim.*
subrugosa, *D'Orb.*
testudinalis, *Müll.*
textilis, *Gould.*
variabilis, *Sow.*
virginea, *Müll.*
viridula, *Lam.*

Genus SCURRIA, Gray.

Mantle-margin with a series of lamellar papillæ; foot oval, thick.

Shell elevately-conical, solid, surface smooth; apex

central, mamillated; aperture wide, oval, margin regular, entire.

Ex. S. scurra, *Lesson*, pl. 52, fig. 4, 4, *a*. Shell, S. scurra, fig. 4, *b*.

This genus is founded upon the *Patella scurra* of Lesson, which is the *Acmæa mitra* of Eschscholtz, and the *Lottia pallida* of Sowerby. The margin of the mantle is surrounded by a number of singular, sub-annular, curved, lamellar processes, which resemble gills; the branchial plume, however, exists in a cervical cavity, as in *Tectura*.

Species of Scurria.

conica, *Gould.* scurra, *Lesson.*

Genus HELCION, Montfort.

Shell oval, depressly-conical, cap-shaped, surface with radiating, pectinated ribs; apex excentric, recurved, submarginal; interior covered with a vitreous deposit, margin of aperture crenate; muscular impression crescentic, interrupted in the region of the head.

Ex. H. pectinatus, *Linnæus*, pl. 52, fig. 5.

The shell of *Helcion* does not appear to differ generically from that of *Scutellina*, except that the interior of the aperture is covered with a peculiar glazed deposit. The nature of the gills has not been well made out; Dr. Gray, however, states that they resemble those of *Patella*.

Genus SCUTELLINA, Gray.

Animal provided with eyes.

Shell orbicular or ovate, depressly-conical or cap-shaped, surface cancellated, or with radiating ribs or striæ; apex sub-central, or sub-marginal and posterior; aperture wide, circular, or ovate, margin often bordered internally, outer edge more or less crenulated; interior with a cresentic, muscular impression, interrupted in the region of the head.

Syn. Scutella, *Brod.*, not *Lam.*

Ex. S. ferruginea, *A. Adams*, pl. 52, fig. 6, 6, *a*. Shell, S. crenulata, *Broderip*, fig. 6, *b*. S. (Iothia) fulva, *Müller*, 6, *c*.

This genus is composed of a series of beautiful and delicate shells from the Red Sea, Panama, the Philippines, and the north of Europe; they are usually of a white colour, and very similar in form and sculpture to *Helcion*. The lingual riband in the sub-genus *Iothia*, which scarcely differs, even in the shell, from *Scutellina*, is composed of a single series of squares, on each of which a single trilobed tooth is borne, flanked on each side by two distinct accessorials. (Forbes.)

Species of Scutellina.

Arabica, *Rüpp.*
asperulata, *A. Adams.*
cinnamomea, *Gould.*
costata, *A. Adams.*
crenulata, *Brod.*
elongata, *A. Adams.*
ferruginea, *A. Adams.*
Galathea, *Lam.*
granulosa, *A. Adams.*
lævicostalis, *A. Adams.*

Sub-gen. IOTHIA, Forbes (Pilidium, *Forbes* and *Hanley*. Patelloida, *Cantr.*, not *Quoy and Gaim.*).

Shell with the apex sub-central; aperture with the margin entire.

fulva, *Müll.*

Genus LEPETA, Gray.

Animal blind.

Shell obovate, depressly-conical, surface with radiating striæ; apex excentric, posterior; aperture oval, muscular impression horse-shoe-shaped, open anteriorly.

Syn. Propilidium, *Forbes and Hanley.* Pilidium, *Midd.*, not *Forbes.*

Ex. L. cæca, *Müller*, pl. 52, fig. 7. Shell, L. cæca, fig. 7, *a.*

In this genus, which is established on the *Patella cæca* of Müller, the animal is deprived of eyes, the tentacles are short and obtuse, and there is a single, central, rachidian tooth on the lingual membrane.

Species of Lepeta.

cæca, *Müll.*
candida, *Couth.*
commoda, *Midd.*
rubella, *Müll.*

Fam. GADINIIDÆ.

Head distinct, flattened; tentacles expanded, funnel-shaped; eyes sessile. Gill single, placed obliquely across the back of the neck. Foot, flat, thin, simple.

Shell depressly-conical; aperture with a siphonal groove anteriorly on the right side.

In this family the gill is single and cervical as in *Tecturidæ*, but the tentacles are expanded and infundibuliform. The groove in the interior of the shell, for the anal siphon, resembles that of *Siphonaria*, but the genera

are unlike each other in the position of the gill and in the form of the head.

Genus GADINIA, Gray.

Shell depresssly-conical, surface radiated; apex subcentral, or a little posterior; aperture wide, expanded, muscular impression horse-shoe-shaped, the right side shortest, terminating at the siphonal groove; siphonal groove in the front of the right side of the muscular scar.

Syn. Mouretia, *Sow.* Lyria, *Gray.* Clypeus, *Scacchi*, not *Klein.*

Ex. G. Garnotii, *Payraudeau*, pl. 52, fig. 8. Shell, G. Afra, *Gray*, fig. 8, *a.*

The animals of this genus have very similar habits to those of the *Patellidæ.* Adanson, who first observed them, living on the rocks of the Island of Gorée, and of Cape Manuel, named them "Gadin."

Species of Gadinia.

Afra, *Gray.*
costata, *Krauss.*
Garnotii, *Payr.*
Peruviana, *Sow.*
reticulata, *Sow.*
stellata, *Sow.*

Fam. PATELLIDÆ.

Mouth armed with horny jaws; lingual riband very long; teeth in numerous transverse rows (2·4·2), central, two pairs; lateral, two on each side, the inner one larger and lower down, uncini three. Head with a short muzzle; tentacles subulate, with the eyes on the outer side of their swollen bases. Mantle-margin fringed; gill on the

inner surface of the mantle, forming a more or less complete ring just beneath the margin. Side of foot with a sunken groove.

Operculum none.

Shell simple, conical; muscular impression crescentic, interrupted in front.

The continuous series of branchial lamellæ forming a fixed cordon between the mantle and foot, together with the peculiarities of their lingual dentition, serve to distinguish this family from the *Tecturidæ;* from the *Chitonidæ* the presence of tentacles and eyes, and the simple, conical nature of the shell at once separate them. The *Patellidæ* are strictly littoral in their habits, living upon the rocks between tide-marks; they are chiefly sedentary, adhering firmly by atmospheric pressure, and feeding on the sea-weed within reach of their long tongues; during the night-time, however, they make short excursions, indicated by the irregular tracks they form, probably by rasping the surface of the rocks with their foot.

Genus PATELLA, Linnæus.

Mouth emarginate below; gills extending nearly round the body, interrupted on one side near the neck.

Shell non-spiral, orbicular or oval, depressly-conical, surface smooth, or with radiating ribs or striæ; apex subcentral, inclined anteriorly; aperture wide, the margin entire or spinose, simple within.

Syn. Patellaria, *Llwyd.* Eruca, *Tourneſ.*, not *Swains.* Patellus, *Montf.* Patellarius, *Dum.* Goniclis, *Rafin.*

Ex. P. vulgata, *Linnæus*, pl. 52, fig. 9. Shell, P. testudinaria, *Linn.*, fig. 9, *a.*

The species of this genus are very numerous, and are world-wide in their geographical distribution, being found on the shores, usually affixed to rocks, to which they adhere with the greatest tenacity. The *Patellæ* possess the power of boring in a slight degree; the excavations are produced simply by mechanical attrition, the foot being strengthened with hard, crystalline, siliceous spicula, similar to those in the foot of the perforating *Pholades*. One species, *P. vulgata*, is very abundant on our own shores, and is extensively used by fishermen as bait; in the north of Ireland many tons' weight are annually collected as food among the poor.

Species of Patella.

Adansonii, *Dkr.*
ænea, *Martyn.*
albida, *Mart.*
angulosa, *Gmel.*
argentea, *Quoy and Gaim.*
athletica, *Lam.*
barbata, *Linn.*
Capensis, *Gmel.*
chlorosticta, *Gmel.*
citrulus, *Gould.*
costoplicata, *Mart.*
clypeaster, *Lesson.*
fimbriata, *Gould.*
flammea, *Gmel.*
flexuosa, *Quoy and Gaim.*
granatina, *Linn.*
granularis, *Linn.*
Guineensis, *Dkr.*
guttata, *D'Orb.*
illuminata, *Gould.*
instabilis, *Gould.*
Kraussii, *Dkr.*
laciniosa, *Linn.*
langula, *Meusch.*
lineata, *Lam.*
Lowei, *D'Orb.*
luctuosa, *Gould.*
lugubris, *Mart.*
luteola, *Lam.*
Lusitanica, *Gmel.*
Magellanica, *Gmel.*
mamillaris, *Linn.*
miniata, *Born.*
nigro-squamosa, *Dkr.*
novem-radiata, *Quoy and Gaim.*
oculata, *Meusch.*
oculus, *Born.*
ornata, *Dillw.*
Paumotensis, *Gould.*
petasus, *Meusch.*
piperita, *Gould.*
puncturata, *Lam.*
Reynaudi, *Desh.*

rota, *Chem.*
rustica, *Linn.*
saccharina, *Linn.*
sagittata, *Gould.*
scutellaris, *Lam.*
spectabilis, *Dkr.*
spinulosa, *Meusch.*
stellifera, *Gmel.*
stellularia, *Quoy and Gaim.*
talcosa, *Gould.*
Tarentina, *Lam.*
testudinaria, *Linn.*
tramoserica, *Chem.*
Tranquebarica, *Gmel.*
tuberculifera, *Lam.*
Ulyssiponensis, *Gmel.*
vulgata, *Linn.*
zonata, *Schub. and Wag.*

Sub-gen. SCUTELLASTRA, H. and A. Adams.

Shell stellate, surface radiately ribbed; vertex sub-central; margin of aperture with radiating processes.

gorgonica, *Humph.*
pentagona, *Born.*
plicata, *Born.*

Sub-gen. CYMBULA, H. and A. Adams.

Shell oblong, laterally compressed, surface radiately striated; vertex hooked; aperture with the margin entire.

compressa, *Linn.*

Sub-gen. OLANA, H. and A. Adams.

Shell ovate, oblong, depressed, narrowed in front, dilated and rounded behind, surface radiately striated; vertex obtuse; aperture with the margin slightly irregular.

cochlear, *Gmel.*

Genus NACELLA, Schumacher.

Mouth entire below; gills interrupted in front of the head, and ending nearly symmetrically on each side of the neck.

Shell thin, semi-pellucid, cap-shaped, surface smooth; apex anterior, recurved, nearly marginal; aperture wide, oval, internally opalescent, margin simple, entire.

Syn. Patina, *Leach.* Ansates, *Sow. jun.*

Ex. N. pellucida, *Linnæus*, pl. 52, fig. 10. Shell, N. cymbalaria, *Lamarck*, fig. 10, *a*.

The "Sea-weed Limpets" are readily distinguished from the "Rock Limpets" even by their shells, which are smooth, thin, sharp-edged, and cap-shaped. They are usually found parasitic on sea-weed, adhering to the fronds or even imbedding themselves in the parenchyma of the stalks, as *N. insessa*, and a variety of *N. pellucida* on our own shores. Species of *Nacella* are inhabitants of the British Islands, the Cape of Good Hope, Cape Horn, and Australia.

Species of Nacella.

cærulea, *Linn.*
cymbalaria, *Lam.*
Delessertii, *Phil.*
depicta, *Hinds.*
hyalina, *Phil.*
insessa, *Hinds.*
pellucida, *Linn.*
plumbea, *Lam.*
radians, *Gmel.*
vitrea, *Phil.*

Fam. CHITONIDÆ.

Lingual riband long and linear, furnished with numerous transverse series of teeth; three central or rachidian,

the median small; the laterals large, with dentated hooks, uncini five, trapezoidal, one of them erect and hooked. Head surrounded by a semi-circular veil or hood; eyes and tentacles none; mouth with cartilaginous jaws. Gills, in a series of lamellæ, between the mantle and foot round the sides and posterior part of the body. Foot oblong, rounded at each end.

Shell composed of eight transverse valves or imbricated plates, immersed in the coriaceous mantle which forms an expanded margin beyond them.

There are several anatomical peculiarities in these animals, which have caused many eminent authorities to hesitate even in considering them *Mollusca*. The number of shelly valves covering their bodies gives them an articulated appearance; their heart is central and elongated, like the dorsal vessel of the *Annelida;* their organs of reproduction are symmetrical, and have two orifices; the sexes are united; and the intestine is straight, with the anal orifice posterior and median. These considerations induced M. Blainville to constitute a special group for them between the *Mollusca* and *Annelida*, and which he named *Polyplaxiphora*. The opinion of Cuvier, however, that they are Gasteropodous Mollusks is more in accordance with nature; their gills are like those of the *Patellidæ;* their foot is that of a true Gasteropod; and in their lingual armature and stomach they resemble the *Prosobranchiate Mollusca;* the extra portions of shelly covering, moreover, are considered by Dr. Gray as so many detached plates separated from the fore part of the hind valve, which he regards as the homologue of the shell of *Patella*.

Sub-fam. CHITONINÆ.

Mantle simple, without any pores or tufts of spines on the sides.

This sub-family is naturally divided into those which have the valves exposed, including the first eleven genera, and those in which the valves are more or less covered by the mantle, comprising the last three genera. Dr. Gray finds that the plate of insertion of the anterior and posterior valves of the first section is divided into several lobes, and that of the central valves into two lobes, while in the second division the plate of insertion of all the valves has a single notch on each side, and that of the hinder valves a single notch on each side, with a concave sinuosity below.

Genus LOPHYRUS, Poli.

Mantle covered with regularly-disposed, smooth, imbricate, roundish, conspicuous scales.

Shell with the valves external, transverse, broad; the hinder valve with the apex superior.

Syn. Lophuriderma, *Poli.* Radsia, *Gray.* Gymnoplax, *Gray.* Lophurus, *Gray.*

Ex. L. squamosus, *Linnæus,* pl. 53, fig. 1.

The margin of the plate of insertion of the valves is divided into lobes more or less denticulated, and the posterior valve is entire behind; the mantle-margin is conspicuously tessellated with smooth, roundish scales. The species, which are very numerous, are found in all parts of the globe.

Species of Lophyrus.

Adelaidensis, *Reeve.*
æreus, *Reeve.*
albolineatus, *Sow.*
aquatilis, *Reeve.*
articulatus, *Sow.*
assimilis, *Reeve.*
australis, *Sow.*
Barnesii, *Gray.*
Bowenii, *King.*
Canariensis, *D'Orb.*
Capensis, *Gray.*
concentricus, *Reeve.*
Coreanicus, *Adams and Reeve.*
Cumingii, *Frembl.*
dispar, *Sow.*
dissimilis, *Reeve.*
divergens, *Reeve.*
evanidus, *Sow.*
excavatus, *Gray.*
fasciatus, *Wood.*
gemmulatus, *Shuttl.*
glaucus, *Gray.*
Goodallii, *Brod.*
granosus, *Frembl.*
jugosus, *Gould.*
Incei, *Reeve.*
insculptus, *A. Adams.*
lævigatus, *Sow.*
lyratus, *Sow.*
magnificus, *Desh.*
marmoratus, *Chem.*
muricatus, *A. Adams.*
Novæ Hollandiæ, *Gray.*
patulus, *Sow.*
pellis-serpentis, *Quoy and Gaim.*
petaloides, *Gould.*
picus, *Reeve.*
pruinosus, *Gould.*
quercinus, *Gould.*
Quoyi, *Desh.*
rugulatus, *Sow.*
scarabæus, *Reeve.*
Siculus, *Gray.*
Sinclairii, *Gray.*
squamosus, *Linn.*
Stangeri, *Reeve.*
Stokesii, *Brod.*
striatus, *Barnes.*
sulcatus, *Wood.*
tulipa, *Quoy.*
virgulatus, *Sow.*
undatus, *Spengl.*
viridis, *Spengl.*

Genus CALLOCHITON, Gray.

Mantle covered with very minute, elongate, rhombiform, closely-pressed scales, producing a reticulated appearance.

Shell with the valves external, broad, transverse; hinder valve with the apex sub-central.

Ex. C. fuliginatus, *Adams and Reeve*, pl. 53, fig. 2, 2, *a*. C. lævis, *Pennant*, fig. 2, *b*.

In this genus, which is remarkable for the smooth, reticulate aspect of the mantle-margin, the plate of insertion of the terminal valve is many-lobed, and that of the middle-valves four-lobed.

Species of Callochiton.

castaneus, *Wood.*
cerasinus, *Chem.*
fuliginatus, *Adams and Reeve.*
fulgetrum, *Reeve.*
interstinctus, *Gould.*
lævis, *Penn.*
pulchellus, *Gray.*
punctulatissimus, *Sow.*
puniceus, *Couth.*

Genus LEPIDOPLEURUS, Risso.

Mantle covered with minute, flattened, longitudinally-grooved scales.

Shell with the valves external, broad; the hinder valve with the apex sub-central.

Syn. Ischnochiton, *Gray.* Ischnoradsia, *Shuttlew.*

Ex. L. limaciformis, *Sowerby*, pl. 53, fig. 3. L. Cajetanus, *Poli*, fig. 3, *a*. L. pectinatus, *Sowerby*, fig. 3, *b*.

The plates of insertion of the valves in this group are thin and smooth-edged; those of the central valves have a single notch in some species, but in others they are four- to five-lobed; the laminæ of insertion of the terminal valves are many-lobed. The species are numerous, and have a world-wide distribution.

Species of Lepidopleurus.

alatus, *Sow.*
antiquus, *Reeve.*
Cajetanus, *Poli.*
caliginosus, *Reeve.*

canaliculatus, *Quoy and Gaim.*
carinulatus, *Reeve.*
castus, *Reeve.*
catenulatus, *Wood.*
catillus, *Reeve.*
circumvallatus, *Reeve.*
colubrifer, *Reeve.*
contractus, *Reeve.*
corrugatus, *Reeve.*
crispus, *Reeve.*
decussatus, *Reeve.*
Dieffenbachii, *Reeve.*
divergens, *Reeve.*
erythronotus, *C. B. Adams.*
floccatus, *Sow.*
granulosus, *Frembl.*
illuminatus, *Reeve.*
incarnatus, *Reeve.*
inquinatus, *Reeve.*
Janeirensis, *Gray.*
lateritius, *Shuttl.*
limaciformis, *Sow.*
longicymba, *Blainv.*
lutulatus, *Shuttl.*
Luzonicus, *Sow.*
Magdalensis, *Hinds.*
Mediterraneus, *Gray.*
metallicus, *Reeve.*
pallidulus, *Reeve.*
pallidus, *Reeve.*
papillosus, *C. B. Adams.*
pectinatus, *Sow.*
pertusus, *Reeve.*
platessa, *Gould.*
productus, *Reeve.*
Proteus, *Reeve.*
pulcherrimus, *Sow.*
purpurascens, *C. B. Adams.*
reticulatus, *Reeve.*
Rissoi, *Payr.*
sculptus, *Sow.*
segmentatus, *Reeve.*
squamulosus, *C. B. Adams.*
stramineus, *Sow.*
striolatus, *Gray.*
textilis, *Gray.*
ustulatus, *Reeve.*
viridulus, *Couth.*
virgatus, *Reeve.*

Genus LEPTOCHITON, Gray.

Mantle-margin covered with minute, granule-like, round, smooth scales, not imbricate.

Shell with the valves external, broad, transverse; the hinder valve with the apex sub-central, superior.

Syn. Stenosemus, *Midd.*

Ex. L. asellus, *Chemnitz*, pl. 53, fig. 4. L. cinereus, *Linnæus*, fig. 4, *a*.

In *Leptochiton* the plates of insertion are rudimentary, without any notches in either the terminal or central

valves. The species are usually of rather a small size, and are principally inhabitants of the shores of temperate climates, being found in Greenland, Britain, the Mediterranean, and Western America.

Species of Leptochiton.

albus, *Linn.*
arbutum, *Reeve.*
asellus, *Chem.*
cancellatus, *Leach.*
cinereus, *Linn.*
cingillatus, *Reeve.*
Colliei, *Gray.*
crocinus, *Reeve.*
exiguus, *Sow.*
giganteus, *Tiles.*
lævigatus, *Flem.*
lividus, *Midd.*
lentiginosus, *Sow.*
Mediterraneus, *Gray.*
Mertensii, *Midd.*
Milleri, *Gray.*
muscarius, *Reeve.*
muricatus, *Tiles.*
proprius, *Reeve.*
pusillus, *Sow.*
pusio, *Sow.*
ruber, *Linn.*
scrobiculatus, *Midd.*
versicolor, *A. Adams.*
virescens, *Reeve.*

Genus TONICIA, Gray.

Mantle simple, horny, naked, smooth or glabrous.

Shell with the valves external, transverse, broad; the hinder valve with the apex superior.

Syn. Tonichia, *Gray* (olim).

Ex. T. elegans, *Frembley*, pl. 53, fig. 5, 5, *a*.

The laminæ of insertion of the terminal valves are many-lobed, and those of the middle bi-lobed. According to Dr. Gray, the valves are similar, with regard to their plates of insertion, to those of *Chiton*, and that of the posterior valve is entire. The chief external peculiarity, however, consists in the simplicity of the mantle-margin;

the species inhabit Greenland, Peru, Chili, the Philippine Islands, and New Zealand.

Species of Tonicia.

atrata, *Sow.*
Brandtii, *Midd.*
Chilensis, *Frembl.*
Chilöensis, *Sow.*
crenulata, *Brod.*
disjuncta, *Frembl.*
elegans, *Frembl.*
Eschscholtzii, *Midd.*
fastigiata, *Gray.*
granifera, *Sow.*
Grayi, *Sow.*
insignis, *Reeve.*
lineata, *Wood.*
lineolata, *Frembl.*
marmorea, *O. Fabr.*
Merckii, *Midd.*
picta, *Reeve.*
Sitchensis, *Midd.*
Swainsoni, *Sow.*
truncata, *Sow.*

Genus CHITON, Linnæus.

Mantle densely beset with unequal, corneo-calcareous, often very long spines, or with small, calcareous spicula, giving it a spinulose appearance.

Shell with the valves external, broad, transverse; the hinder valve with the apex sub-central.

Syn. Scutigerulus, *Meusch.* Acanthopleura, *Guild.* Canthapleura, *Swains.* Corephium, *Gray*, not *Browne.*

Ex. C. brevispinosus, *Sowerby*, pl. 54, fig. 1. C. aculeatus, *Linnæus*, fig. 1, *a.*

The calcareous nature of the spicula which cover the mantle-margin, will at once distinguish the species of this genus from those of *Chætopleura*, in which they are horny. The plates of insertion of the terminal valves are many-lobed, of the posterior sometimes somewhat obsolete, and of the middle bi-lobed. The *Corephium* of Browne, figured previously by Petiver under the name of *Asellus marinus*, is a Crustaceous animal.

Species of Chiton.

aculeatus, *Linn.*
acutirostratus, *Adams and Reeve.*
brevispinosus, *Sow.*
cælatus, *Reeve.*
Californicus, *Nutt.*
Columbiensis, *Sow.*
Cunninghami, *Reeve.*
fortiliratus, *Reeve.*
Fremblii, *Brod.*
gigas, *Chem.*
labeculatus, *Reeve.*
linter, *Chem.*
luridus, *Sow.*
Magellanicus, *Chem.*
magnificus, *Gray.*
micans, *Gould.*
mucronulatus, *Shuttl.*
muscosus, *Gould.*
Owenii, *Gray.*
piceolus, *Shuttl.*
piceus, *Gmel.*
Polii, *Phil.*
pulcherrimus, *Sow.*
salamander, *Spengl.*
scaber, *Reeve.*
scabriculus, *Sow.*
Sowerbianus, *Reeve.*
spiniger, *Sow.*
spinosus, *Brug.*
spinulosus, *Gray.*
tuberculiferus, *Sow.*

Genus CHÆTOPLEURA, Shuttleworth.

Mantle beset with horny bristles.

Shell with the valves external, broad, transverse; the hinder valve with the apex sub-central.

Syn. Eudoxochiton, *Shuttlew.* Craspedochiton, *Shuttlew.*

Ex. C. Peruviana, *Lamarck*, pl. 54, fig. 2.

In this genus the laminæ of insertion of the hinder valve are many-lobed, those of the middle valves bi-lobed, or six-lobed, but the obvious feature of distinction consists in the mantle-margin being covered with hairs or horny bristles, instead of with calcareous spines.

Species of Chætopleura.

fulva, *Wood.*
Hanleyi, *Bean.*
Hennahi, *Gray.*
laqueata, *Reeve.*
nobilis, *Gray.*
Peruviana, *Lam.*
rugosa, *Sow.*
Watsonii, *Sow.*

Genus ONITHOCHITON, Gray.

Mantle-margin densely covered with short bristles or chaff-like scales.

Shell with the valves external, transverse, broad; the hinder valve with the apex terminal.

Ex. O. undulatus, *Quoy and Gaimard*, pl. 54, fig. 3.

The lamina of insertion of the anterior valve in this genus is few-lobed, that of the posterior sub-emarginate and entire, and that of the middle bi-lobate. The species of *Onithochiton* are not very numerous, and are found chiefly in Australia and New Zealand.

Species of Onithochiton.

concentricus, *Reeve.*
Lyellii, *Sow.*
puncticulatus, *Reeve.*
Sueziensis, *Reeve.*
undulatus, *Quoy and Gaim.*

Genus ENOPLOCHITON, Gray.

Mantle horny, sparsely covered with oblong, unequal, elongated, flattened, calcareous scales.

Shell with the valves transverse, external, sub-cordiform; the hinder valve with the apex terminal.

Ex. E. niger, *Barnes*, pl. 54, fig. 4.

In this genus the lamina of insertion of the anterior valve is few-lobed, that of the posterior somewhat obsolete, entire, and receding, and that of the middle bi-lobed. Only a single species, from the coasts of Chili, has been hitherto discovered. The plates of insertion are very similar to those of *Plaxiphora*.

Genus LORICA, H. and A. Adams.

Mantle-margin very densely covered with small, smooth, ovate, imbricate scales, the posterior margin fissured.

Shell with the valves broad, transverse, external; the hinder valve small, with the apex terminal, produced, and notched on its hind lower edge.

Syn. Aulacochiton, *Shuttleworth.*

Ex. L. cimolia, *Reeve*, pl. 54, fig. 5.

The plate of insertion of the anterior valve in *Lorica* is few-lobed, that of the posterior deeply emarginate, and obsoletely lobed, and that of the middle valves bi-lobate. The squamose mantle distinguishes this genus from *Schizochiton* and *Mopalia*, and the deep notch in the centre of the hind margin of the posterior valve from *Lophyrus*.

Species of Lorica.

cimolia, *Reeve.* volvox, *Reeve.*

Genus SCHIZOCHITON, Gray.

Mantle-margin broad, horny, sparsely covered with small, chaff-like, and cylindrical curved scales, the posterior margin deeply fissured.

Shell with the valves external, narrow, elongate, sub-cordate; the hinder valve large, with the apex posterior, and with a deep notch on its hind lower edge.

Ex. S. incisus, *Sowerby*, pl. 54, fig. 6, 6, *a*.

The plates of insertion are nearly the same in this genus as in *Chiton*, that of the terminal valves being few-lobed, that of the posterior deeply fissured, and that of the middle tri-lobed; the fissured mantle-margin is the most obvious external character: Two species only, from the Philippines, are known.

Species of Schizochiton.

elongatus, *Reeve.* incisus, *Sow.*

Genus MOPALIA, Gray.

Mantle-margin moderately wide, bristly or hairy, with a sinuosity on the hinder lower edge.

Shell with the valves almost external, broad, transverse, slightly covered at the sides by the mantle; the hinder valve large, with the apex sub-central, and posteriorly slightly sinuated.

Ex. M. Hindsii, *Sowerby*, pl. 54, fig. 7.

In this genus the plate of insertion of all the valves has only a single notch on each side. The front edge of the mantle is sometimes greatly dilated, and a small portion of the lateral areas of the valves of the shell is covered by the mantle.

Species of Mopalia.

asperrima, *Couth.* ciliata, *Sow.*
Blainvillii, *Brod.* Hindsii, *Sow.*

petasus, *Adams and Reeve.*
Simpsonii, *Gray.*
vespertina, *Gould.*

Genus KATHARINA, Gray.

Mantle-margin horny, smooth.

Shell with the valves deeply immersed in, and partly covered by, the mantle, the exposed parts small, cordate, as broad as long; the hinder valve with the apex subcentral.

Ex. K. tunicata, *Wood*, pl. 54, fig. 8.

In this genus the lamina of insertion is greatly produced, that of the anterior valve nine-lobed, that of the posterior four-lobed, and that of the middle bi-lobate. The margins of insertion are nearly as in *Mopalia*, but the valves are more covered, and the mantle-margin is bare and horny.

Species of Katharina.

Douglasiæ, *Gray.*
submarmorea, *Midd.*
tunicata, *Wood.*

Genus CRYPTOCHITON, Gray.

Mantle with tufts of spicula; gill extending all round.

Shell with the valves internal, entirely concealed by the mantle; umbo of growth of all the valves central.

Ex. C. Stelleri, *Middendorff*, pl. 55, fig. 1, 1, *a*.

In this genus the beak of all the valves is central, and the shell is quite internal, being entirely enclosed on every side by the mantle, which covers the body like a capsule; the epidermis is somewhat pustulose, the pustules

everywhere covering the back and containing fascicles of bristles. A single species only is known, from the shores of Kamtschatka.

Sub-fam. CRYPTOPLACINÆ.

Mantle with a double series of pores beset with horny bristles, or a single series of pores furnished with tufts of calcareous spines.

In this sub-family the general similarity of the animals to the annulose tribes is even more striking than in the last division, on account of the tufts of spicula surrounding the pores along the sides of the mantle. There are four genera, not very numerous in species, and all remarkable for the large portion of the valves covered by the mantle.

Genus AMICULA, Gray.

Mantle covered with scattered fascicles of hairs, and having two series of setigerous pores; gills posterior.

Shell with the valves externally scarcely conspicuous, the exposed parts small, sub-cordate, as broad as long.

Ex. A. vestita, *Sowerby*, pl. 55, fig. 2.

In this genus the shell is concealed under the mantle, except in the median dorsal line, where the valves are free from the mantle and conspicuous externally; the plates of insertion are similar to those of *Cryptoconchus*. There are four species described, all from northern shores.

Species of Amicula.

amiculata, *Pallas.*
Emersonii, *Couth.*
Pallasii, *Midd.*
vestita, *Sow.*

Genus PLAXIPHORA, Gray.

Mantle with a double series of pores beset with bifurcate bristles, one row at the insertion of the valves, the other at the external margin; mantle-margin smooth and horny, or more or less covered with setose or furfuraceous scales.

Shell with the valves broad, transverse, external; the hinder valve small, with the apex posterior, and with a slight notch on the hind lower edge.

Syn. Euplaxiphora, *Shuttleworth.*

Ex. P. Carmichaelis, *Gray*, pl. 55, fig. 3.

In this genus the hinder valve has a slightly-raised, smooth plate of insertion, not divided into lobes at the sides; the plates of insertion of the middle valves are bi-lobate, and those of the anterior usually about nine-lobed.

Species of Plaxiphora.

bipunctata, *Sow.*
biramosa, *Quoy and Gaim.*
Carmichaelis, *Gray.*
petholata, *Sow.*
retusa, *Sow.*

Genus CRYPTOCONCHUS, Blainville.

Mantle with a single series of pores, thick, smooth, elevated at the pores into conical tubercles.

Shell with the valves sub-cordate, with the exposed part very small, linear, much longer than broad.

Ex. C. porosus, *Blainville*, pl. 55, fig. 4.

In this genus the valves are immersed in, and covered by, the mantle, except in the middle line; the plates of insertion of all the valves have only a single notch on each side, which is sometimes rudimentary, and the mantle-margin is not beset with calcareous tufts of spicula as in *Acanthochites*. A single species only is known, from New Zealand.

Genus ACANTHOCHITES, Risso.

Mantle densely spinulose, surrounded with a series of setigerous pores.

Shell with the valves deeply immersed, sub-equal, externally contiguous, with the exposed part moderate, cordate, as broad as long.

Syn. Acanthochitona, *Gray*. Acanthochitus, *Phil.* Phakellopleura, *Guild.* Acanthochiton, *Herrm.*

Ex. A. fascicularis, *Linnæus*, pl. 55, fig. 5.

In this genus the plate of insertion of the anterior valves is six-lobed, that of the middle bi-lobed, and that of the posterior five-lobed. The species are from New Zealand, the Canary Islands, the Indian Ocean, the Mediterranean, and the British Islands; the margins of insertion do not materially differ from those of *Cryptoconchus*.

Species of Acanthochites.

astriger, *Reeve.*
castaneus, *Couth.*
cancellatus, *Adams and Reeve.*
coarctatus, *Sow.*
discrepans, *Brown.*
echinatus, *Tiles.*
fascicularis, *Linn.*
formosus, *Adams and Reeve.*
Garnottii, *Blainv.*
granatus, *Reeve.*
hastatus, *Sow.*
laqueatus, *Reeve.*
porphyreticus, *Reeve.*
scutiger, *Adams and Reeve.*
spiculosus, *Reeve.*
strigatus, *Sow.*
violaceus, *Quoy and Gaim.*
Zealandicus, *Quoy and Gaim.*

Genus CRYTOPLAX, Blainville.

Body vermiform, thick. Mantle spinulose, encircled with a series of setigerous pores.

Shell with the valves sub-internal, the three or four anterior continuous, the others interrupted externally by bridges of the mantle; the exposed part linear, lanceolate, elongate.

Syn. Chitonellus, *Lam.* Chitonella, *Desh.* Chitoniscus, *Herrm.* Ametrogephyrus, *Midd.*

Ex. C. fasciatus, *Quoy and Gaimard*, pl. 55, fig. 6, 6, *a*.

The valves in this genus are deeply immersed in the thick, fleshy mantle, the four anterior being contiguous, the posterior distinct, gradually becoming narrower and diminishing in size. The plate of insertion of the anterior valve is four-lobed, those of the middle and hinder ones entire and thick. The species enjoy considerable powers of locomotion compared with other genera in the family.

Species of Cryptoplax.

fasciata, *Quoy and Gaim.*
Gunnii, *Reeve.*
lævis, *Lam.*
larviformis, *Blainv.*
oculata, *Quoy and Gaim.*
rostrata, *Reeve.*
striata, *Lam.*

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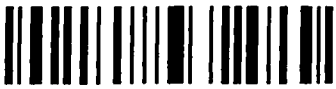
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